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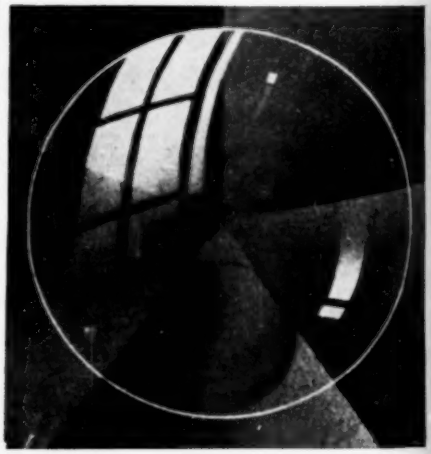

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AMERICAN JOURNAL OF OPHTHALMOLOGY
VOLUME 16 MAY, 1933 NUMBER 5

ACCIDENTS AND COMPLICATIONS OCCURRING IN THE INTRACAPSULAR EXTRACTION OF SENILE CATARACTS

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Philadelphia

The most frequent causes of failure with intracapsular extractions of cataract are discussed and the reasons for these difficulties pointed out. Their elimination by correct use of the author's operation is illustrated.

Accidents occurring during the operation of removing cataracts are due to various causes. The complications also are mainly dependent upon these causes. The avoidance of the resultant complications by realization of the causes of these accidents will make for normal convalescence. Lack of preoperative preparation of the patient plus poor technic account for a goodly number of the avoidable accidents. Since the year 1903, all of my work has been intimately connected with these operative problems in attempting to find a means of prevention of accidents. In 1917, I became firmly convinced that the post-operative complications had their origin in the cataractous remains left in the eye.

In an experience embracing over 5000 operations, certain factors which may be used as a basis for a statistical résumé stand out. First, a definite routine examination is essential. Pathology plays a large part in the etiology of operative accidents and subsequent post-operative complications. In patients with high blood pressure, I have found bleeding to be of distinct benefit in the prevention of a possible intraocular hemorrhage. This procedure, I practice one hour before the operation. Should an increase of urea, cholesterin, or blood sugar be found, the operation should be deferred for these predispose to hemorrhage.

We hesitate to operate upon patients suffering from the various fistulas, uterine prolapses, pyorrhea, and other toxic endogenous infections, for here we have the cause of iridocyclitic and

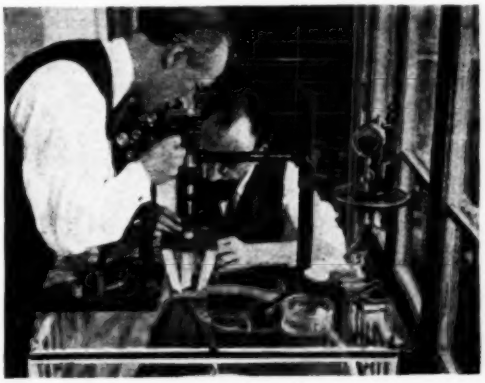
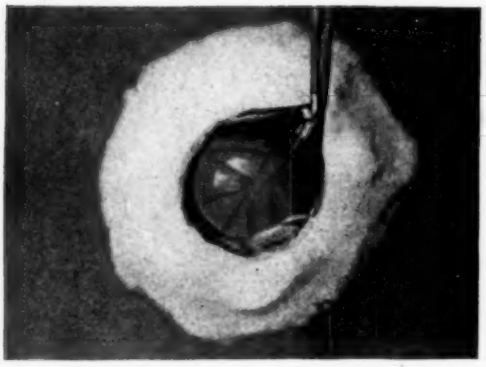
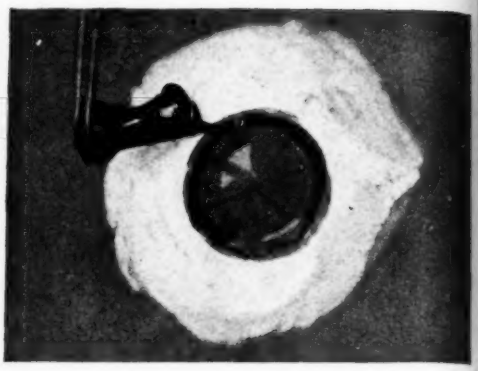


Fig. 1. The camera in operation.

metastatic infections. Auto-intoxications, liver, gastric, and intestinal disturbances, and parasitic infestation, certainly predispose to hemorrhage and to delay in the healing of the wound. A disturbing cough, insomnia, retching, vomiting, fatigue, restlessness, emotional activities are etiological factors in prolapse of the iris, hyphema, the reopening of the wound, and the subsequent delay in healing.

The eye, itself, receives a definite examination embracing the retinal function, the estimation of the tension, the character of corneal reflex, the



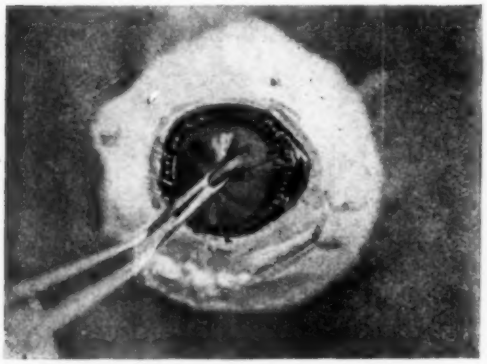


Figs. 2 and 3. The "rooting" of the iris, giving a full view of the cataractous lens.

transparency, diameter, and thickness of the cornea, the depth of the anterior chamber, and the type of cataract. If the lacrimal sac is diseased, it is removed. The trial bandage to determine the presence or absence of offending organisms, must be a part of this preparation. The preoperative preparation of the patient is made in the same bed in which he is later operated upon. The anesthesia of the lids is accomplished by the method of Villard, the anesthesia of the ciliary ganglion by Duverger's technic, and the anesthesia of the superior rectus by the method of Dr. Sobhy Bey. The local application of three instillations of adrenalin in a 1 to 1000 solution, and three instillations of a solution of 10 percent cocaine is given during the ten minutes of waiting for the effect of the previous injections. The lids are kept closed as in sleep. If this precaution is not taken, the cornea dries, becomes hazy, and a small hyperemia appears that means hemorrhage at the moment of completion of the section. A keratitis develops, and after the anesthesia wears off, presents quite an annoying irritation, which the patient attempts to remedy by movement of the eyelids.

Therefore, it is seen that lack of care during the anesthetic stage may be the means of an operative accident, namely hemorrhage from the flap—and a postoperative complication; that is, delay in the healing of the wound. A poor section resulting in little or no flap with a premature escape of the aqueous and an involuntary iridectomy is another

First experiment: Patient, 62 years old, 14 hours after death.
Mature cataract in each eye. Extraction with Kalt forceps, right eye. Extraction with erisiphake, left eye.



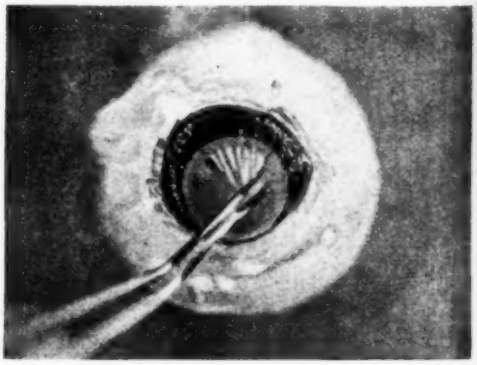
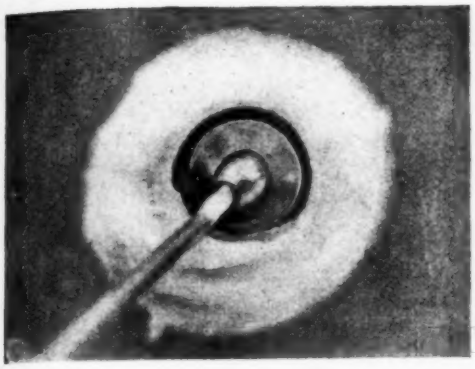
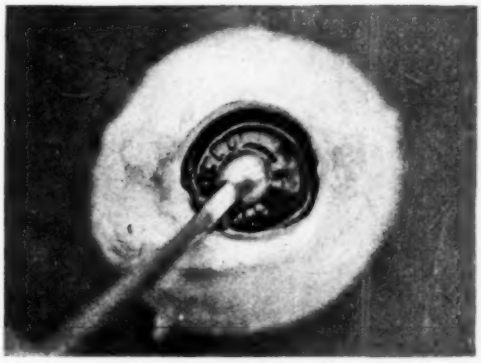


Fig. 4. The forceps grasping the lens and making light pressure to get a firm hold.
Fig. 5. The zonule enormously distended before it ruptures with transmission of this force to the ciliary region.





Figs. 6 and 7. The application of the cup to the opposite cataractous eye without pressure of any kind and the contraction of the lens just at the moment the vacuum is applied, with the molding of the lens in the cup. The rupture of the zonule is accomplished at this time and the lens extracted without traction of any kind.

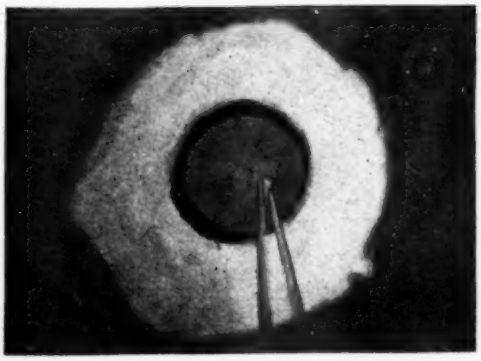
avoidable accident, due mostly to poor technic. The iridectomy must be truly peripheral and performed entirely in the anterior chamber. A dark room with focal illumination and a Gullstrand loupe is essential for accomplishing this.

It has been said that the cup produces luxation of the lens, aspiration of the vitreous, and a rupture or "rooting" of the iris. The true reason is the lack of dexterity of the operator. The loss of vitreous before, during, or after the extraction, iris prolapse, lens luxation, flap inversion, and rapid extraction of the cataract, are always the result of pressure on the eye after section, since if the anesthesia is complete, the operator alone is at fault.

The rupture of the capsule is frequent in intracapsular extraction with the capsule forceps, as the relatively

Second experiment: Patient, 82 years old, 12 hours after death.

Mature cataract in each eye. Extraction with Elschnig forceps, right eye; extraction with erisiphake, left eye.



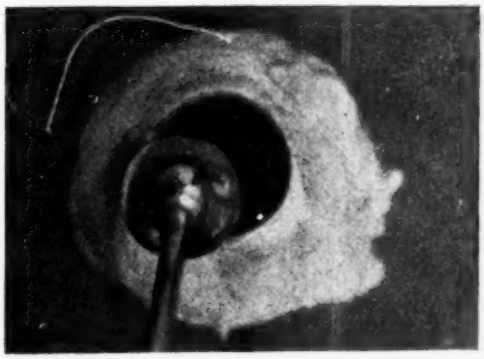
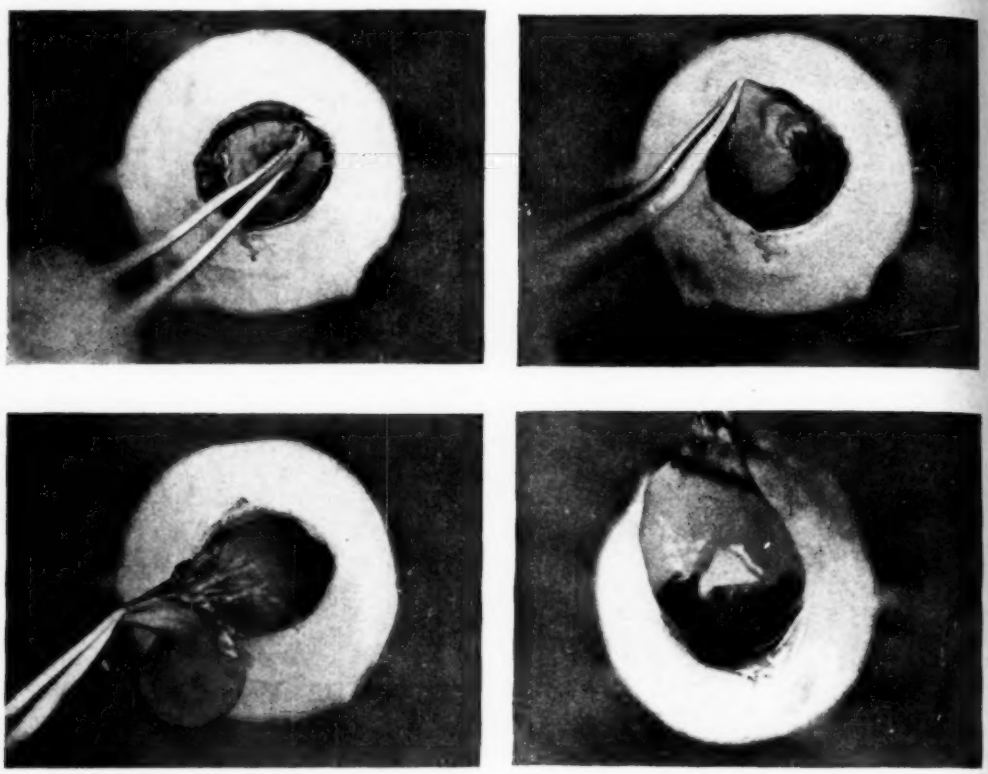


Fig. 8. The cataract was so hard and the sclerosed nucleus so large that it was impossible for the forceps to get a bite on the friable capsule without tearing it. As the forceps were closed, the capsule ruptured and a capsulotomy was performed. We had to give up the thought of a total extraction and follow the classical method, leaving in the eye the capsule and soft equatorial substance with the resultant potential bad results of incarceration of the iris, late plastic iridocyclitis, secondary cataract, detachment of the retina, and secondary glaucoma.

Fig. 9. The total removal of the cataract with the erisiphake without any difficulty. In a hard cataract the vacuum must be higher because the cataract is less deformable and as the zonule is weaker because of the age, the number of interruptions per minute may be reduced.

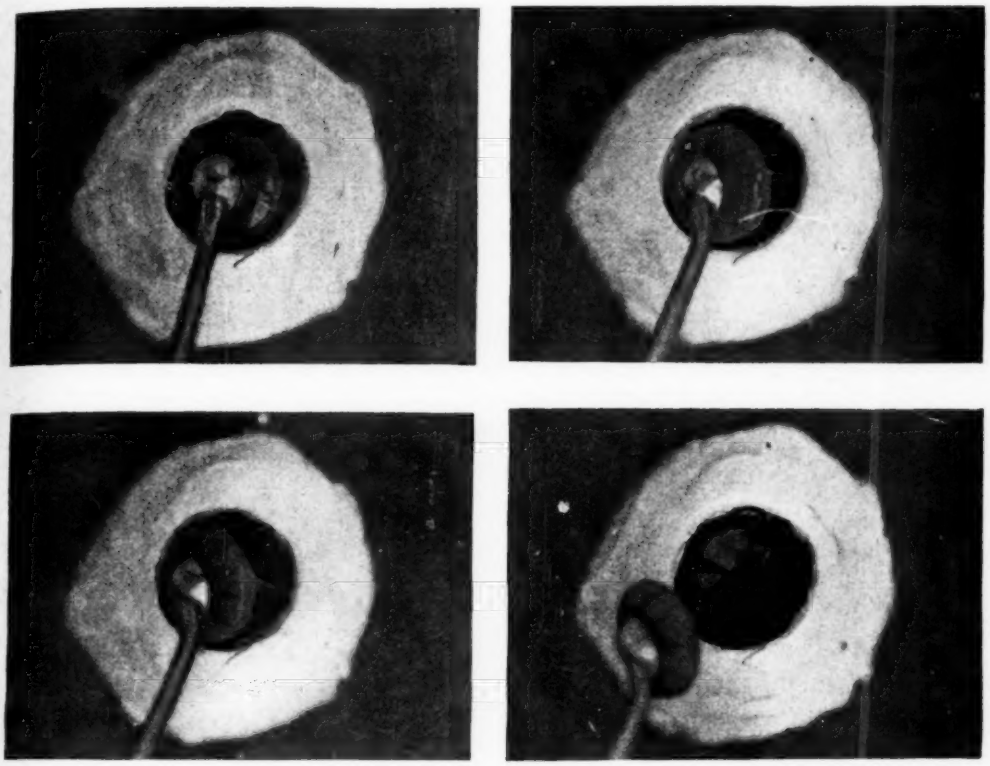
Third experiment: Patient, 45 years old, 19 hours after death.
Soft cataract in each eye. Extraction with the Elschnig forceps, right eye; extraction with the erisiphake, left eye.



Figs. 10, 11, 12, and 13. With a good grasp of the capsule with the Elsching forceps and traction having been made, the zonule would not rupture, but it is seen that the capsule tore and the contents of the capsule, cortical and nuclear, escaped with the loss of vitreous.

small bit of capsule grasped has to resist the traction necessary to break the zonule. This is less likely to happen with the pneumatic foceps, as its diameter is greater and no traction is exerted on the capsule, the zonule alone rupturing by the transmitted vibrations of the electrical pump. The force of these vibrations is regulated according to the type of each cataract and the probable type of the capsule. With the forceps, rupture of the capsule is unavoidable; with the erisiphake, the rupture is avoidable, and when it does occur, the operator has been at fault in some phase of the operation. Care must be exercised in suturing the conjunctival flap, if we are to avoid the incarceration due to the infolding of the conjunctiva, or an increase in the astigmatic error. The bandage must be fixed in place around the orbit with adhesive plaster to avoid stress or undue pressure on the operated eye. The first dressing is done on the fourth day, provided there has been no reason to dress the eye earlier.

The eye must be viewed in a subdued light. The upper lid is never touched. The examination is made by slight pressure with the thumb on the lower lid, and having the patient look up slowly. With the Gullstrand loupe, one can see if the pupil is round, central, and clear, if the anterior chamber is reformed, if there is hyphemia present, or if the eye presents anything of especial interest. The matted secretion on the lids is not removed. The second



Figs. 14, 15, 16, and 17. The left eye shows the total extraction of the cataract with the erisiphake. Vacuum employed was 50 cm. mercury, 4000 interruptions per minute. In this case the erisiphake did not abruptly rupture the zonule, but after some moments the zonular fibers were seen separating from the lens and the total extraction was completed.

bandage is kept on the eye for three or four days.

After dressing on or about the eighth day, the sutures are removed under cocaine anesthesia. A reopening of the flap at this time is most troublesome and presents real complications. A reopening of the wound, with the consequent delay in healing, produces a traumatic keratitis, which, however, will disappear in the course of a few days. The late iridocyclitis, secondary cataract, retinal detachment, incarceration of the iris, rupture of the hyaloid membrane, and loss of vitreous are factors avoidable by the operator. In the extraction with forceps the force transmitted to the ciliary region is not avoidable and results in complications such as iridocyclitis, detachment of the retina, hemorrhages, and other difficulties.

The operations illustrated were performed on the cataractous eyes of patients whose death occurred in the course of some disease, not referable to the eye. The eye was dissected from the orbit, placed on a special stand, and the cornea removed. The iris was torn from its attachment, the so-called "rooting" of the iris. A low-power microscope was placed in position over the eye, and connected with the camera by means of a prismatic tube which recorded the operation and allowed the camera operator to view the different steps and make the necessary adjustments.

Figures 14 to 17 inclusive, demonstrate the advantages of the erisiphake over the forceps, and the way to avoid the insidious cyclitis, decentration of the pupil, ciliary hemorrhage, detachment of the retina, the alterations in the vitreous, and the secondary cataracts.

EPIDEMIC SUPERFICIAL KERATITIS

SARADINDU SANYAL, M.B.
CALCUTTA

This is a description of a first epidemic at Calcutta during the monsoon period, presenting five types of corneal involvement and other variations from the form reported by Wright in Madras.

Acute superficial keratitis was first described by Fuchs[1] in 1889. At about the same time V. Carion, Adler, and V. Reuss also, independently, gave a description of the disease.

Fuchs described it as an affection of the cornea with acute onset, in which usually one, but sometimes both eyes were involved. The clinical characters were listed as follows: discrete opacities in the superficial layers of the cornea, the number and size varying from numerous gray points visible only with the loupe to isolated points easily seen with the unaided eye. The epithelium over them was smooth, but sometimes elevated; staining was variable. The onset was like that of a mild conjunctivitis. In many cases a history of a catarrhal disease of the respiratory tract was noted. In such cases the opacities appeared from a few days to a few weeks afterward. The course was short and the lesions in the cornea usually disappeared, but in some cases they persisted for a year or more with acute exacerbations. Vision was rarely diminished to any extent. Intraocular tension was sometimes low, but iritis was not generally seen. Young people were not as a rule affected by the epidemic, and recurrences were uncommon. Fuchs considered it an infection. In his opinion, keratitis disciformis, herpes febrilis corneae, and this disease were closely related.

Verhoeff[2], after a histo-pathological study of the disease, concluded that it was of a neuropathic nature.

Kirkpatrick[3] described a variety of superficial keratitis called by him the "macular type," the clinical symptoms of which were as follows: Onset insidious; the opacities were round, gray spots in the superficial layers of the cornea, with a tendency to thin out in the center and assume the shape of a broken ring. The cornea over them was smooth and did not stain. The size and number varied. He described three forms: (1) small multiple opacities just visible to the naked eye; (2) mixed large and small spots, the large ones being crenated or irregular; and, (3) solitary large spots, which might cover half the diameter of the cornea. There was rarely any local discomfort or disability unless the spots happened to be in the pupillary area. He could discover no organism, and considered the origin to be either nutritional or infective.

Wright[4] stated that the standard book types, Herbert's type and the keratitis epithelialis punctata of Koeppe, are but different clinical manifestations of the same disease. He made a microscopic study of the corneal lesions and placed them below Bowman's membrane, which did not necessarily show any change. The larger foci showed changes which affected the whole thickness of the cornea. In some cases the posterior surface of the cornea bulged into the anterior chamber. In his opinion, Kirkpatrick's type is an independent affection. The clinical symptoms of Wright's type are: Onset, slight catarrhal conjunctivitis or slight hyperemia of one eye, which may go unnoticed and may have no antecedent catarrhal or febrile affection. Definite irritation, lacrimation, and photophobia were present in the cases that showed marked hyperemia. Edema of the lid and chemosis were rare. Blurring of the vision was absent unless the pupillary area was involved. There was no conjunctival discharge in uncomplicated cases. Most cases were unilateral. Associated skin lesions, or neuralgic pains in the distribution of the fifth nerve were absent. Frequently the limbal region was definitely swollen and edematous. These cases showed definite lesions in the conjunctiva. Sometimes the cornea appeared to be perfectly smooth and

transparent; in other cases there were large solitary disciform opacities. The transparency was considered by him to be due to the nondevelopment of spots. Tension was not lowered except in a small percentage of cases. The duration of the attack ranged from one week to a year; in the majority of cases it was two months. Corneal sensibility was preserved. Wright failed to come to a definite conclusion as to the etiology of the disease.

In all of the types described above, the lesions were more or less rounded in form.

The epidemic in Calcutta

During the monsoon months in Calcutta from July to September, 1932, a number of cases of superficial keratitis cropped up in epidemic form. A total of 175 cases was seen, some of them daily. At first the significance of the cases was not clear, but later on, as the number rapidly increased, the epidemicity was clearly recognized. A description of these cases is given for they represent the first epidemic of superficial keratitis seen in Calcutta, although isolated cases were not hitherto unknown.

Chief characteristics of the disease: (1) Photophobia, varying from slight discomfort in bright light to an actual sense of irritation even in artificial light, so that in some instances the patient dreaded to go out in broad daylight or to be subjected to artificial light. This latter condition, however, was absent in most of the cases.

(2) Pain along the distribution of the supraorbital or trigeminal nerve was absent. Some patients felt a slight brow ache. There was no tenderness of the globe, nor did any movement of the globe bring about discomfort.

(3) Vision was but rarely diminished, the slight diminution that occurred being generally unnoticed. In a few cases the patient complained of a slight fogginess, but none had less than 6/12 vision. In the latter group most of the patients had a vision of 6/9.

(4) Age limits were: lowest, 10; highest, 60. The incidence in each decade was as follows:

Age	*No. of cases*
10 to 20	30
21 to 30	90
31 to 40	383
41 to 50	111
51 to 60	7

(5) As to sex, males were more affected in this series, the proportion being 3:1.

(6) The season was the monsoon period. There seemed to exist a definite relation between the number of cases, the humidity, and the temperature.

(7) Antecedent illness. Almost all the patients had had mild attacks of coryza without any actual rise of temperature either a few days before or accompanying the onset of the disease. The attack was in many cases of a transient nature, scarcely noticed by the patient, in some cases being admitted only after distinct, direct questioning.

(8) No glandular involvement was present in any of the cases, nor were any constitutional symptoms present.

(9) The white-blood-cell count was as follows: total 6,000 to 7,000.

polymorphonuclears	56 to 58 percent
small	38 to 36 percent
large	4 to 3 percent
eosinphiles	2 to 3 percent

This is somewhat like the eosinophilia of Parinaud's conjunctivitis as reported by Gifford.

(10) Prognosis and course. Most of the patients recovered within a week or ten days. A few cases (about eight percent, especially of those belonging to types D. and E. (p. 392) required about three weeks to clear up. One case took about a month to cure. Recovery was generally complete and no complications were noticed.

(11) The incidence in families and hostels for university students. Cases were seen in the same hostel, sometimes all the roommates suffered. In a family several members were attacked either simultaneously or in sequence.

(12) Status in life. None were exempt; all, from the poorest hospital patient to the richest, seemed to be equally affected.

(13) Eye affected. The attack was usually unilateral.

(14) Transmission. It has not been

possible to trace the method of transmission, for no reliable histories could be secured.

(15) **Ocular examination:** The upper lids were always slightly hyperemic even in the mildest cases. This, together with a slight blepharospasm and photophobia, gave the patient a characteristic appearance. In the severer types there was a very slight edema of the lids and the congestion was more marked.

Conjunctiva. No case was seen with conjunctival discharge, but there was almost always a hyperemia of the palpebral conjunctiva, more marked near the inner side.

Cornea. Lesions in the cornea took the following forms: A. Punctate—three or four centrally situated gray dots, sometimes distinctly seen on ordinary inspection, at other times invisible to oblique illumination; but when the image of a metal filament of a 150-c.p. electric bulb was obliquely focused on the cornea, they became visible. The central portion of the spots was most dense, gradually fading toward the periphery. The margins were either crenated or round and smooth. In size they were about one millimeter in diameter.

B. Linear—one or two centrally situated wavy lines with tapering ends, about the diameter of a hair; thickest in the middle, about four or five millimeters in length, with two or three crests. They seemed to be slightly raised above the general surface of the cornea. The surrounding cornea was clear. They were placed at any angle and passed through the central portion of the cornea without branching. They were generally single, but when double usually crossed each other at the center at variable angles. These were also visible by the same method as that given above.

C. A combination of the above types.

D. A type characterized by a localized loss of corneal luster, beginning at the periphery near the limbus and extending up to the center. This was more or less in the form of a truncated cone with a base about two or three millimeters long at the periphery of the cornea, the sides having no sharp, regular outline. These were situated in any quadrant.

E. A band of fine homogeneous opacities completely surrounding the periphery of the cornea, beginning at the limbus and spreading toward the center, in a more-or-less-annular fashion, for about two millimeters, somewhat resembling a map depicting the comparative heights of the various peaks in a mountain range.

Corneal sensibility did not seem to be affected.

Ciliary injection was scarcely visible in the first and second types, a very faint zone of pinkish area being visible with careful inspection. A distinct but not marked injection occurred in other types.

The iris was normal in pattern and the pupils reacted promptly to light.

Intraocular tension as measured by the Schiötz tonometer was usually between 18 and 20 mm. (two percent holocaine was used). This is normal for Calcutta.

The anterior chamber was normal; its contents also appeared to be normal.

The lens and vitreous seemed to be normal.

The fundus presented no abnormality.

(16) The etiology was not properly investigated for lack of a fully equipped laboratory. Smear preparations from the conjunctiva showed in many cases pneumococci, either alone or together with streptococcus or staphylococcus, but not in large numbers.

(17) Treatment. Locally, one-half percent of yellow oxide of mercury, and five percent argyrol lotion were given. Internally, Liq. Donovoni, five minims; calcium chlorine, ten grains; ext. taraxaci liq., one dram were prescribed, to be taken three times a day.

Conclusions

It will be observed that this epidemic is different from that at Madras in course, prognosis, and complications. It is true that no careful study of the etiology of the epidemic has been made, but even if the two epidemics—the one

at Calcutta and the other at Madras—prove to be due to the same causative agent, the clinical description of a first epidemic under different climatic conditions might prove to be useful.

19, Hari Ghosh street.

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SIZE OF PUPIL AS A POSSIBLE INDEX OF OCULAR FATIGUE

M. Luckiesh and Frank K. Moss

CLEVELAND

Morning and afternoon measurements over a period of four weeks were made on nine subjects to determine what change, if any, occurred in the pupillary area as the result of close visual work. There is apparently a dilatation of the pupil due to "ocular fatigue" which would seem to be referable to muscular rather than to retinal fatigue. From the Lighting Research Laboratory of the General Electric Company, Nela Park, Cleveland.

Since much remains uncertain and uninvestigated concerning fatigue in general, it is not to be expected that absolute criteria for the appraisal of ocular fatigue should be available. However, indirect or relative methods for obtaining quantitative appraisals of ocular fatigue may be of considerable assistance in the problem of improving conditions under which the eyes must function. Careful and extended investigations have been made which have endeavored to show a correlation between the development of ocular fatigue and changes in such factors as visual acuity and speed of vision. These methods[1,2], and numerous others[3], have proved to be more or less unreliable or difficult of practical application and interpretation. The research method discussed in this paper apparently possesses the advantage of sensitivity and perhaps the added advantage of inherently interesting interpretations.

In the performance of visual work, the size of the pupils varies with photic stimulation, with the associated movements of accommodation and convergence, and, to a lesser extent, with certain other influences. These variations may be conveniently designated as temporary changes. It is reasonable to suspect that some semi-permanent pupillary change may be produced by several hours of continuous and exacting visual work and that this pupillary change will largely disappear after a period of rest. If this is the case, a comparison of measurements of pupillary size made at the beginning and at the end of a long period of visual work should reveal such a semi-permanent change in the area of the pupil. If such a change is observed, it may be assumed to be an indirect index of ocular fatigue developed during the period of visual work.

This problem was investigated by measuring the size of the pupils of nine subjects at the beginning and at the close of a day's work. During the interval between these series of measurements, the subjects were engaged in various kinds of clerical and general laboratory work. All measurements were made with the eyes adapted to the same brightness-level and with a constant state of accommodation. The room in which the measurements were made was uniformly illuminated to an intensity of approximately 10 foot candles, as measured upon a horizontal plane. The subjects were required to fixate upon a small, black-and-white

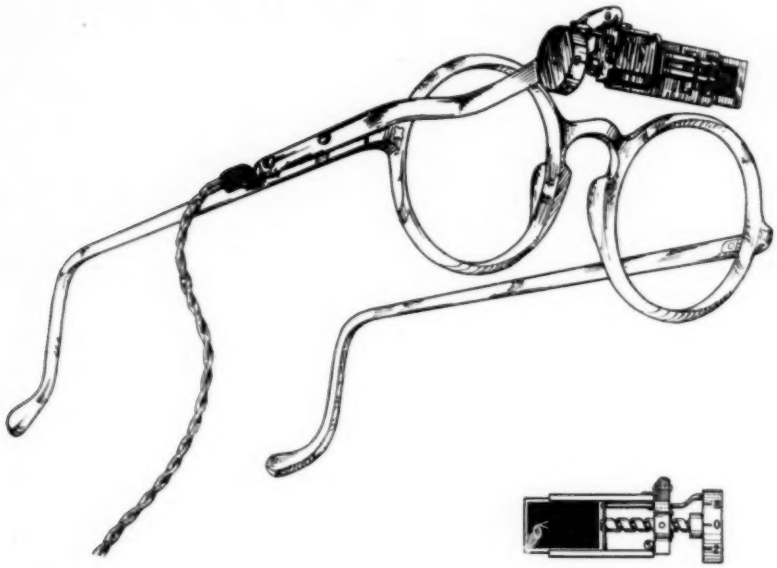

Fig. 1 (Luckiesh and Moss). A modification of the Broca pupillometer. The instrument proper measures approximately ½ by 1 inch in size and has a total weight of 29 grams. The instrument is calibrated to give the diameter of the pupil in tenths of a millimeter.

test object located on a buff-colored wall at a distance of 15 feet, while the pupillary size was being determined. The test object was rotated slowly in order to facilitate exact and constant fixation.

The measurements were made with a pupillometer designed by one of the authors and of the general type suggested by Broca[4]. In this instrument, the diameter of the pupil is measured by the distance between two pin-points of light, so located and separated that the images of the pupil cast upon the retina appear tangential. The details of this instrument are shown in figure 1. The subject wears the instrument as ordinary eyeglasses are worn, fixates upon a definite object, and adjusts the distance between the two points of light

Table 1

THE DIAMETERS OF THE PUPILS, AS DETERMINED FROM 22 SERIES OF 5 MEASUREMENTS EACH, ARE GIVEN FOR 9 SUBJECTS IN THE SECOND AND THIRD COLUMNS. THE LAST COLUMN GIVES THE RELATIVE PROBABLE ERRORS OF THE RATIOS OF AFTERNOON TO MORNING MEASUREMENTS.

Subject	Pupillary diameter (mm.)		Ratio $\frac{\text{P.M.}}{\text{A.M.}}$	Probable error of ratio
	8:30–9:30	4:00–5:00		
1	6.16	6.25	1.014	.007
2	4.17	4.38	1.056	.015
3	4.97	5.54	1.115	.005
4*	7.32	7.35	1.003	.004
5	6.35	6.60	1.041	.011
6	4.83	5.14	1.065	.008
7	4.46	4.94	1.111	.015
8	5.89	6.49	1.104	.008
9	4.67	4.93	1.056	.011
Arithmetic Mean			1.063	.010
Geometric Mean			1.062	

* An average of 16 series of measurements.

until the retinal images appear tangential. During this procedure it is obviously essential that the accommodation remain constant.

The results of the experiment are presented in Table 1. A series of five measurements was taken in the morning and again in the afternoon for each subject on each of twenty-two different days. Therefore, the values of pupillary diameter given in Table 1 represent the averages of 110 separate measurements on each subject with the exception of the case designated by an asterisk. In the last column of Table 1 are given the relative probable errors of the ratio of the afternoon to the morning measurements.

It will be noted from these averages that the pupil dilated approximately 6 percent in diameter or 13 percent in area during the course of the day. From the statistical viewpoint this difference in pupillary size is to be regarded as significant, since it is more than six times the probable error of the measurements. In addition, it will be noted the pupils of all subjects showed a dilatation as the day progressed. Such agreement among subjects is not always obtained in physiological researches.

The data in Table 2 indicate the frequencies of the pupillary changes of various magnitudes. The negative values indicate a contraction and the positive values of dilatation of the pupil.

In general, it was observed that on occasions when the subjects volunteered the information that their eyes "felt tired," there was a marked increase in the pupillary area for the afternoon period as compared with that of the morning. No attempt has been made to present this subjective data in tabular form. However, a mathematical analysis of the data gives no indication of a bi-modal distribution of the changes in pupillary area. Therefore, little importance may be attached to the introspective reports of the subjects.

A further analysis of the same data indicates that the size of the pupil not only increases during the day, but also slowly and somewhat irregularly increases as the week progresses from Monday to the close of the work-week on Friday afternoon. The data summarized in Table 3 are for a period of four weeks.

From these data it appears that the effect of the day's use of the eyes in the work-world is not entirely dissipated by relaxation at night, and that further relaxation from near-visual work is required. It is probable that the eyes of these subjects were not subjected to unusual variations in photic stimulation during the non-work days of Saturday and Sunday and that the contraction of the pupils occurring during this period is chiefly a result of a reduction in the near-visual work. If this is assumed to be true, then it follows that "ocular fatigue" is apparently due to

Table 2

THE FREQUENCIES OF PUPILLARY CHANGES OF VARIOUS MAGNITUDES ARE SHOWN IN THE SECOND COLUMN. THIS TABLE WAS COMPILED FROM 176 SEPARATE COMPARISONS OF THE DIAMETER OF THE PUPIL AT THE TWO DESIGNATED PERIODS OF THE DAY.

Ratio $\frac{\text{P.M.}}{\text{A.M.}}$	Frequency	Average ratio	Percent change in pupillary area
.85– .90	2	.882	−22.2
.90– .95	4	.935	−12.5
.95–1.00	29	.982	−3.6
1.00–1.05	50	1.025	+5.0
1.05–1.10	38	1.076	+15.7
1.10–1.15	32	1.122	+25.7
1.15–1.20	14	1.170	+37.0
1.20–1.25	3	1.228	+51
1.25–1.30	1	1.269	+61
1.30–1.35	3	1.308	+71

muscular rather than retinal fatigue. Such a conclusion finds support in other independent analyses.

It may be concluded from these data that the pupil changes in size during the course of a day's work and that this change is very generally one of dilatation. Whether this change is due to the performance of visual work or to some physiological cycle obviously cannot be definitely determined from these data. A possible explanation is that the continuous functioning of the iridic muscles develops fatigue in these muscles, which in itself may be an indirect measure of general ocular fatigue.

The authors acknowledge the assistance of Mr. L. L. Holladay and Mr. S. K. Guth in the accumulation of these data.

Table 3

THE SIZE OF THE PUPILS IN THE MORNING AND AFTERNOON OF EACH DAY OF THE WORK-WEEK.

Subject	Monday		Tuesday		Wednesday		Thursday		Friday	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
1	5.98	6.33	6.18	6.18	6.27	6.06	6.15	6.21	6.19	6.42
2	4.00	4.22	4.20	4.22	4.19	4.43	4.17	4.50	4.63	4.67
3	4.91	5.49	5.05	5.54	4.89	5.49	5.01	5.59	5.07	5.65
5	6.22	6.43	5.36	6.34	6.46	6.56	6.43	6.72	6.34	6.78
6	4.82	5.05	4.72	5.00	4.83	5.34	4.94	5.24	4.84	5.11
7	4.44	4.85	4.51	5.07	4.29	4.96	4.67	4.00	4.50	4.79
8	5.58	6.22	5.98	6.40	5.83	6.61	6.11	6.62	5.98	6.60
9	4.66	4.77	4.49	4.81	4.74	4.97	4.66	4.92	4.84	5.24
Geometric Mean	5.02	5.36	5.12	5.39	5.12	5.50	5.21	5.39	5.25	5.60

(Subject No. 4 omitted from this summary as a complete series of measurements is not available.)

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ADDITIONAL EXPERIMENTS VERIFYING THE PRESENCE OF TREPONEMA PALLIDUM IN THE CORNEA IN EXPERIMENTAL INTERSTITIAL KERATITIS

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An emulsion from the syphilitic testicle of a rabbit was injected subconjunctivally into two other rabbits that subsequently developed interstitial keratitis. The corneae showed active treponemata and an emulsion from them when injected into the testes of other rabbits induced induration and swelling, in which the organism could again be demonstrated. Stained specimens from both corneae and testes were also positive for treponemata. From the Wilmer Ophthalmological Institute of the Johns Hopkins Hospital. Read before the American Ophthalmological Society, New London, June 10, 1932.

In 1928[1] I made a preliminary report (Amer. Jour. Ophth., v. 11) upon this work before the Ophthalmological Section of the Baltimore City Medical Society. At that time I showed that there was a divergence of opinion among various authors and investigators as to the presence of treponema in the cornea in this condition. For example, Collins and Mayou[2], as well as Spicer[3], state that the treponemata have never been found in the human cornea in cases of interstitial keratitis. In 1925 Jaeger[4] studied the corneas of a patient, twenty-one years of age, who had a typical case of interstitial keratitis and who had died suddenly from influenza. He was unable to demonstrate the organism in either cornea.

On the other hand v. Hippel[5] apparently demonstrated the treponemata in the cornea of a stillborn syphilitic child by the use of Levaditi's stain; Igersheimer[6], in a section of cornea removed from an active case of interstitial keratitis in a patient fourteen years of age; and Clausen[7], in the cornea of a four-and-a-half-months-old child who had had active keratitis and who had died from a general syphilitic involvement of the internal organs. Igersheimer[8] also reported the presence of the organisms in the cornea of rabbits that developed metastatic interstitial keratitis following a testicular inoculation as well as in cases that resulted from a more direct inoculation into the anterior chamber. The presence of the treponema in experimental interstitial keratitis was seemingly confirmed by Bertarelli[9], Greef and Clausen[10], as well as by Chesney and Kemp[11], the latter of whom demonstrated the organisms by use of the dark field.

In 1927 Löwenstein[12] studied the question and came to quite different conclusions. He stated that a spontaneous keratitis often developed in rabbits from six to eight months after receiving a testicular inoculation. Also if a syphilitic rabbit received an intracorneal injection of normal serum an interstitial keratitis would develop. The same condition resulted if the conjunctiva was incised or the superior rectus and its vessels were severed. Microscopic studies revealed a round-cell infiltration about the anterior ciliary vessels, which condition he believed caused a disturbance of the nutrition of the cornea that resulted in interstitial keratitis.

In view of these conflicting opinions, both in clinical cases and experimental investigations, my experiments were undertaken. In the preliminary report previously mentioned I conclusively demonstrated that a typical interstitial keratitis would almost universally develop in about six weeks following an injection of a testicular emulsion which showed treponemata when examined by the dark field, whether the injection was made into the anterior chamber or given subconjunctivally close to the limbus. The keratitis may start at the point of injury or may start upon the opposite side of the cornea.

Sections of the corneas stained by Levaditi's method showed short sinuously curved bodies which we believed were the treponemata pallida. The same specimens were examined by a syphilologist who gave it as his opinion that the bodies were artefacts instead of organisms.

In view of this difference of opinion as to the presence of the treponemata in the cornea in interstitial keratitis, the

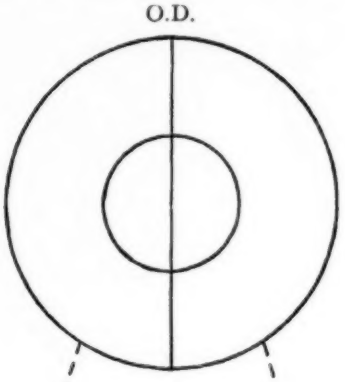
question was further studied as follows: A testicle of a rabbit that had been inoculated previously with the treponemata and that showed well-marked orchitis, was removed and small portions ground up in a mortar with normal saline solution. The fluid was then examined under the dark field and active treponemata pallida were demonstrated. One-tenth cubic centimeter of this fluid was then injected subconjunctivally above each cornea of rabbit No. 1 (light brown) on November 21, 1930. No reaction occurred until December 19, 1930, when a slight injection was noted over both superior recti muscles. On January 2, 1931, bilateral keratitis with vascularization was present in each cornea at its upper margin.

The keratitis was more pronounced on January 9, when the animal was killed. Both corneae were removed and divided into two parts. One-half of each cornea was placed in formalin for hardening, sectioning, and staining, while the other half was ground in a sterile mortar with normal salt solution. The resulting fluid from the right cornea was then injected into the right testicle of rabbit No. 6, while that from the left cornea, which had been similarly treated, was injected into the right testicle of rabbit No. 7 (table 1).

Table 1

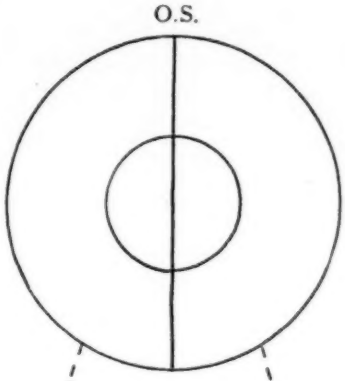
LIGHT BROWN RABBIT

Nov. 21, 1930, Bilateral subconjunctival injection of 1/10 c.c. testicular emulsion containing treponemata pallida.
Jan. 2, 1931, Bilateral interstitial keratitis.
Jan. 9, 1931, Sacrificed.



Ground in mortar and injected into right testicle, rabbit No. 6.
Feb. 20, 1931 No reaction.
March 13, 1931 Orchitis.
March 19, 1931 Sacrificed.

Sectioned and stained Warthin-Starry method.
A few treponemata were found.



Ground in mortar and injected into right testicle, rabbit No. 7.
Feb. 20, 1931 Orchitis.
March 19, 1931 Sacrificed. Dark-field examination showed active treponemata.

Sectioned and stained Warthin-Starry method.
Numerous treponemata present.

Rabbit No. 6 developed an orchitis on March 13 with enlarged inguinal glands. Rabbit No. 7 showed swelling and induration of the inoculated testicle on February 20, forty-two days after the inoculation. This condition gradually increased until March 19, when the rabbit was killed and a section of the testicle was placed in a ten-percent solu-

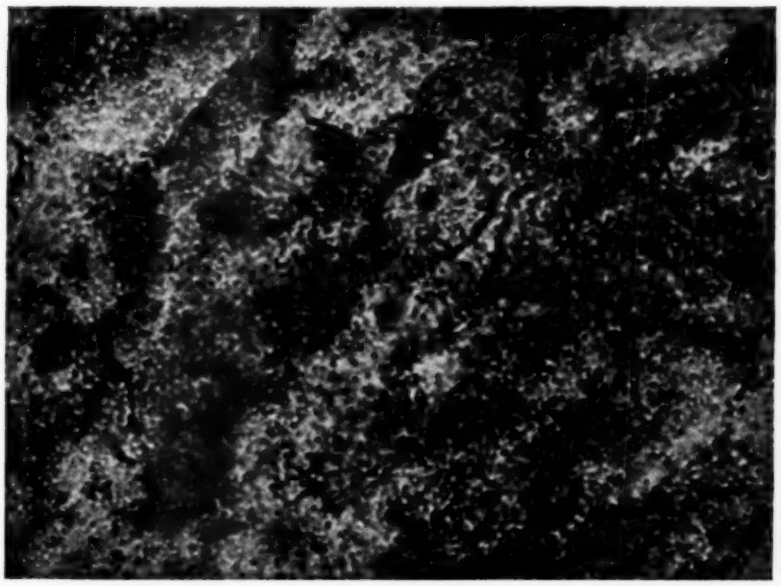


Fig. 1 (Clapp). Photomicrograph of left cornea of rabbit No. 1, showing numerous treponemata.

tion of formalin and a portion of the remainder ground in a mortar and the fluid examined under the dark field. Numerous treponemata pallida were found in active motion. The corneas of this rabbit were sectioned and stained by the Warthin-Starry method and the treponema demonstrated (fig. 1). Sections of the testicles were also stained by the same method. The treponemata could also be demonstrated in these sections but their number seemed to be

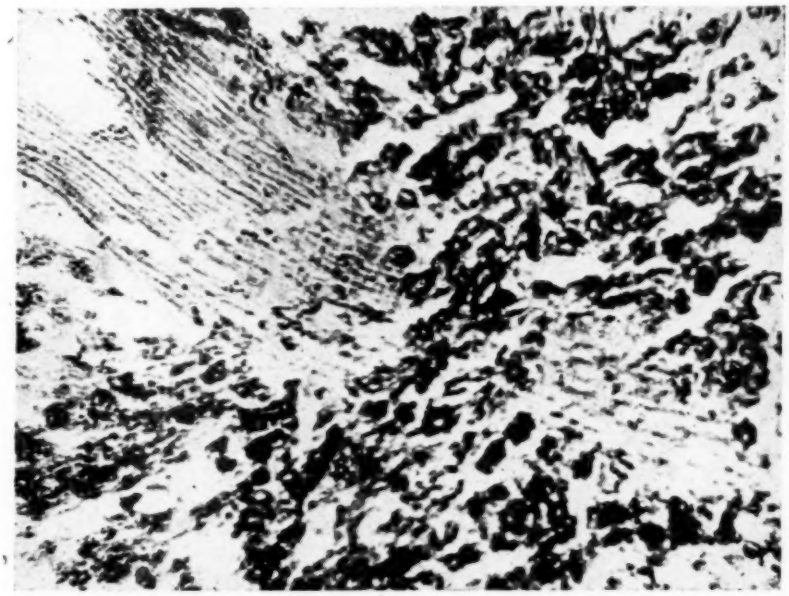


Fig. 2 (Clapp). Photomicrograph of right testicle of rabbit No. 7, showing indistinct treponemata near center of field.

fewer than in the corneal sections (fig. 2).

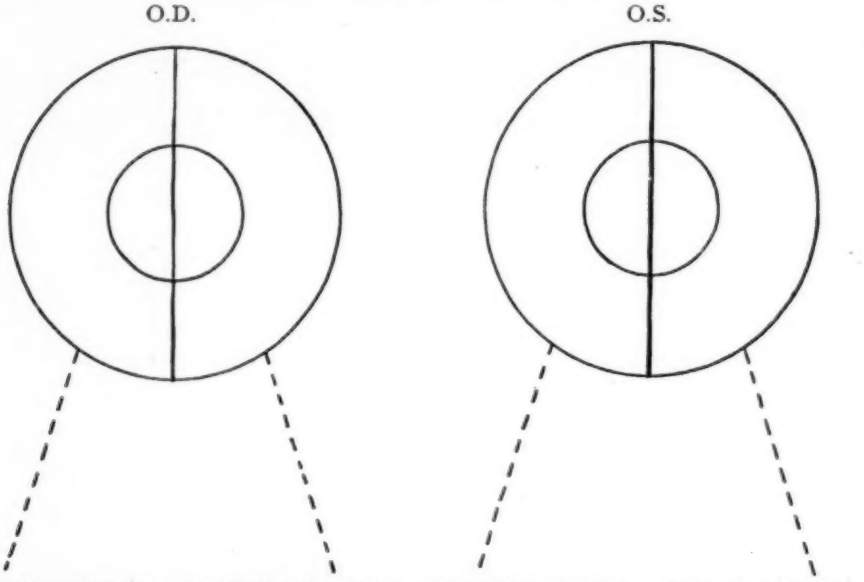
Rabbit No. 2 (white) was also inoculated with one-tenth cubic centimeter of the testicular emulsion containing treponemata on November 21, 1930. Three days later there was a rather marked iritis with exudates into both anterior chambers. The iritis had subsided by November 28 and the exudates had been absorbed. The eyes remained quiet until December 26 when some injection appeared above each cornea and by January 2, 1931, keratitis was found to be present in each eye. The infiltration into the cornea began to subside on January 8 and the animal was killed on January 9. The right cornea was divided, one portion being placed in formalin, and the other prepared in the mortar and inoculated into each testicle of rabbit No. 8 (table 2). The left cornea was also divided and similarly treated, using rabbit No. 9 for the inoculation. By February 20 both testicles of rabbit No. 8 and the right of rabbit No. 9 were swollen and indurated and the animals were killed. Dark-field examination of the right testicle of each of these rabbits revealed active treponemata pallida and sections of both the corneas and the testicles stained by the Warthin-Starry method were positive (figs. 3 and 4).

Rabbit No. 3 was inoculated subconjunctivally with one-tenth cubic centimeter of the testicular emulsion on November 21, 1930. No reaction occurred until January 30, 1931, when beginning redness was noted above the left cornea. By March 13 both corneas presented

Table 2

WHITE RABBIT

Nov. 21, 1930, Bilateral subconjunctival injection of 1/10 c.c. testicular emulsion containing treponemata pallida.
Jan. 2, 1931, Bilateral interstitial keratitis.
Jan. 9, 1931, Sacrificed. Each cornea divided and utilized as follows:



O.D.		O.S.	
Ground in mortar and injected into right and left testicle, rabbit No. 8. Feb. 20, 1931 Orchitis. March 19, 1931 Sacrificed. Treponemata demonstrated in dark field.	Sectioned and stained Warthin-Starry method. Few treponemata demonstrated.	Ground in mortar and injected into right testicle, rabbit No. 9. Feb. 20, 1931 Orchitis. March 19, 1931 Sacrificed. Dark field showed active treponemata.	Sectioned and stained Warthin-Starry method. Numerous treponemata demonstrated.

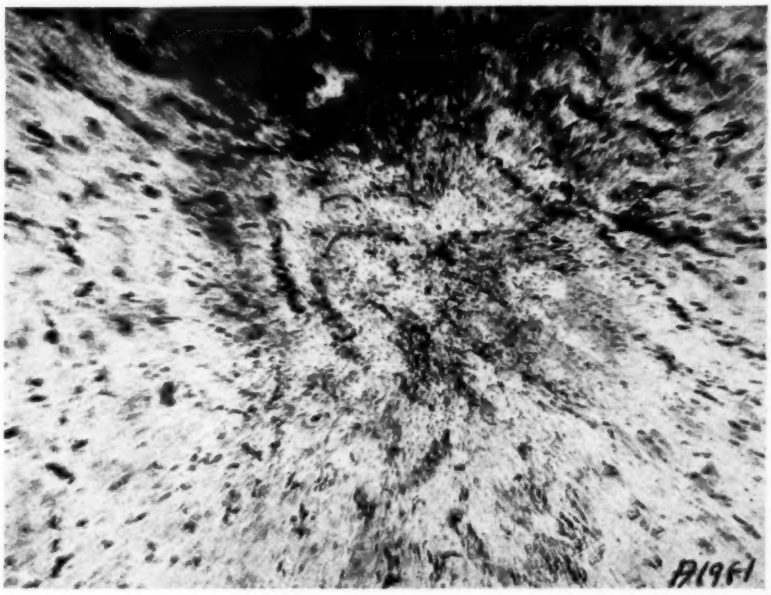


Fig. 3 (Clapp). Photomicrograph of left cornea of rabbit No. 2, showing numerous treponemata.

typical pictures of acute interstitial keratitis. The reaction gradually subsided and on September 25, 1931, the slitlamp showed a nodular opacity in each eye with new-formed vessels at the lower margin. The animal was killed on October 1, 1931, and each cornea divided. One portion of the right cornea, prepared as previously described, was injected into the right testicle of rabbit

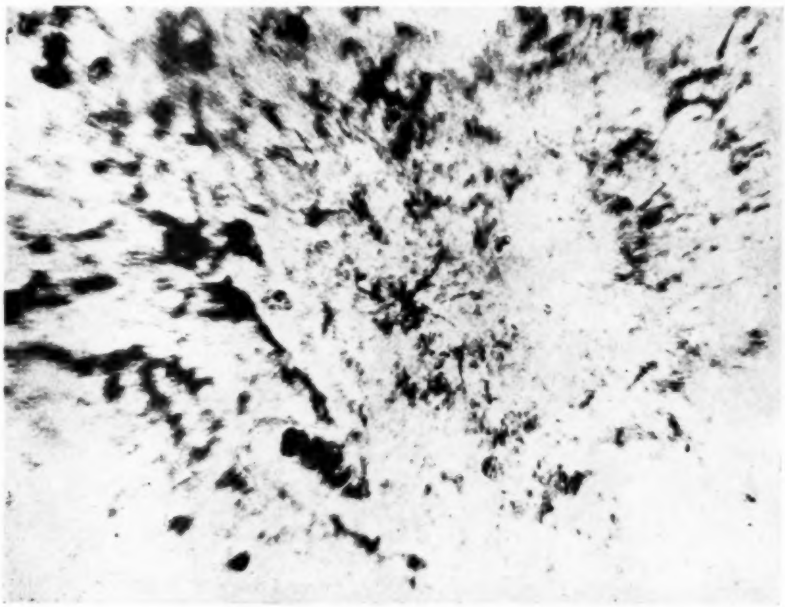


Fig. 4 (Clapp). Photomicrograph of testicle of rabbit No. 8, showing numerous organisms.

No. 333 and a portion of the left cornea into the left testicle of the same rabbit. No induration or swelling occurred in either testicle and the rabbit was killed on January 20, 1932. The corneas were fixed in formalin, sectioned and stained, but, other than the evidences of an old keratitis, no lesion could be demonstrated.

We have therefore definitely proved by the use of both staining and biological methods, that the treponemata are present in the corneas of cases of active, experimental, interstitial keratitis. The presence of the organism in the human cornea has apparently been demonstrated with staining by v. Hippel[5], Igersheimer[6], and Clausen[7]. It would, therefore, seem logical to believe that their active presence in the cornea is a determining factor in active, luetic, interstitial keratitis.

My final problem is to obtain some corneal tissue in the active stage of interstitial keratitis and to repeat this biological test, as well as to make dark-field examination, thus proving beyond question the presence of the treponemata in human luetic keratitis.

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INTERNATIONAL VISUAL STANDARDS FOR AVIATORS

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An international visual standard for aviators as proposed by Onfray at the International Ophthalmological Congress in Amsterdam is here presented with comments and additions by the author.

Although it is a well-known fact that several men who entered aviation before the World War became aces in spite of hyperopia, hyperopic astigmatism, myopia, and myopic astigmatism, it is evident as the years pass that high visual standards for aviators are necessary. In fact, the importance of "super eyes" is so well recognized that certain countries have made international agreements to demand high visual standards for commercial and private airplane pilots. Although[1] in the selection of pilots no tests yet devised can replace actual flying, Cooper's[2] figures in regard to accidents and ability to learn to fly seem to indicate that accidents and lack of adaptability in flying training are usually associated with physical defects.

Visual standards for aviators to be used internationally were proposed by Onfray[3] to the Thirteenth International Congress of Ophthalmology in Amsterdam in 1929. The following is a summary of the requirements:

1. All examinations of aviators' eyes should be made by an ophthalmologist.

2. After inspecting the eyes and adnexa for abnormalities, the following points should be noted:

A. Iris reflexes, examined in a dark room.

a. Direct-light reflex
b. Consensual-light reflex
c. Reaction to convergence

B. Visual acuity. Public-service pilots should have visual acuity of 1.0 in each eye. For pilots in the service 0.7 may be accepted. (I believe this should be qualified to require corrected vision of 1.0 in one eye and 0.8 in the other eye.) Private pilots should have the minimum requirement without correcting lenses, 0.7 in one and 0.5 in the other eye, correctable to 1.0 in one and 0.7 in the other eye. Because of the association between accommodation and convergence only those with a low degree of ametropia should be accepted. Hyperopia of two diopters even though latent, should disqualify. (I believe that in private pilots the two diopters of hyperopia should be manifest and that latent hyperopia should disqualify only pilots whose accommodation is subnormal according to the Duane[4] standard, provided accommodation does not[5] fatigue rapidly.)

C. Visual Field. The visual fields should be normal in each eye and the perimetric chart should be filed with the application.

D. Color Sense. The test should be rigid. That made with Holmgren's wools is not sufficient. First test with the Ishihara and then with the Stilling plates. In cases of doubt Nagel's anomaloscope should be used. (I believe the Edridge-Green lantern should be used in case of doubt.)

E. Speed of Visual Perception. The speed of visual perception should be tested with a tachistoscope.

a. The break in the Landolt ring for 0.1 visual acuity should be located in one second.

b. The color of a light should be determined in 0.25 second.

F. Light Sense. Light sense should be tested with the Nagel or Birch-Hirschfeld apparatus after five-, ten-, and fifteen-minute adaptation. A chart of the curve of adaptation should be attached to the application of each pilot.

Visual acuity in reduced illumination. After twenty minutes of adaptation the visual acuity should be at least 5/100 for an illumination of 0.0015 lux.

G. Binocular vision.

a. Muscle balance normal or with a slight divergence as tested with Remy's diploscope and horizontal and vertical letters or the Maddox Rod. (I believe

what is meant by normal muscle balance should be defined; and suggest the following standard for orthophoria from the study of three hundred consecutive office records and two hundred twenty-three aviators[6] with 20/20 vision with correction, who did no complaining of their eyes and who were healthy in other respects.

1. The muscle balance at 6 meters must not show more than three diopters of esophoria, two diopters of exophoria, or one diopter of hyperphoria.

2. The muscle balance for 25 centimeters must not reveal more than six diopters of exophoria, one diopter of esophoria or hyperphoria.

3. If heterophoria is found it should be considered in conjunction with errors of refraction, fusion, stereopsis, accommodation, associated parallel movements, prism divergence, convergence and sursumvergence, and the near point of convergence.)

b. The fusion of simple images should be tested with three letters and the Remy diploscope.

c. The stereoscopic parallax should be measured by means of a stereoscope in which the visual lines are practically parallel and the accommodation is relaxed. The candidate should read without error stereograms in which this parallax is not greater than 30 or 40 seconds.

d. Stereoscope with three objects or any similar apparatus. The candidate should not habitually make an error of more than 25 millimeters. (I believe that a time limit of twenty seconds should be set for each trial with the six-meter stereoscope and the average of five readings taken. A stereoscope[7] for use at six meters which records the findings on paper has been devised. Milk-glass plates are used as objects, one being brought forward on a carriage and stopped when the observer believes it is parallel to the other test object. The record may be kept permanently and may be attached to the application.)

It is my belief that accommodation should be normal for the age of the individual according to the standards set by Duane[4], although I appreciate[5,8] that this does not necessarily eliminate the man with accommodation that fatigues rapidly.

The near point of convergence should also be tested, for if it is normal, it is an indication that there is probably a reserve power of coordination. By holding the pin at the near point for a minute, valuable information[9] can be obtained in regard to the candidate's ability to resist fatigue.

The British Medical Examination of Aviators[10] states that power of convergence is estimated by giving the following values:

Two inches or under, very good, possibly excessive; two to three inches, good; three to four inches, fair; four inches and over, poor. After having studied 218 aviators[11], I believe that the following standards for convergence are sufficiently accurate for practical purposes and obviate the necessity for the calculation required for taking the near point of convergence to the intercentral base line (Pc.B) or in the determination of the number of meter angles of convergence. The near point of convergence from the cornea must not exceed 100 millimeters, but at 20 years it should not exceed 60 millimeters, at 30 years 70 millimeters, at 40 years 80 millimeters, or 100 millimeters as the upper limit at any age beyond.

H. Reexaminations. Public-service pilots should be reexamined every six months and private pilots every year.

The International Commission for Air Navigation (I.C.A.N.) which was formed in 1919, is now composed of the representatives of twenty-six foreign states. The regulations governing international air navigation[12] include physical standards. Unfortunately the United States has never ratified the agreement although our physical standards for civil aeronautics conform closely to the international requirements.

The following are the international visual standards for Air Navigation: "The candidate must possess, with correction by glasses if necessary, a visual acuity equal to at least eighty percent of the normal visual acuity, for each eye examined separately, or ninety percent for one eye and seventy percent for the other. . . . Binocular vision, ocu-

lar poise, the field of vision of each eye and color perception, must be normal."

Conclusion. It is important not only for the individual pilot but also for passengers that high visual standards for aviators be maintained. If uniform visual standards for aviators can be adopted by all nations it will be an important step in the advancement of aviation.

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OCULAR COMPLICATIONS IN A CASE OF AGRANULOCYTIC ANGINA

Bilateral ring abscess with total visual loss

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An extremely rare ocular complication of this disease is fully described, probably for the first time. It culminated in blindness, although the systemic condition was relieved.
From the Surgical Service of Stanford University Hospital, San Francisco. Read before the Pacific Coast Ophthalmological Society in San Francisco, June 30-July 2, 1932.

Through the courtesy of Dr. Arthur Bloomfield, Professor of Medicine, Stanford University Medical School, I have the opportunity of reporting this most unusual condition. The patient, a seventy-three-year-old, senile, querulous female, was studied by the medical and ophthalmological staffs, of the Stanford University Hospital.

Agranulocytic angina has been known as an entity since W. Schultz[1] in 1922 published six cases in which, as the most important consistent symptom, the almost total absence of the granulocytes formed the most striking picture. Before this, isolated cases such as the one reported by Schwarz[2] in Vienna in 1904, that of Türk[3] in 1907, and some others were known. In this country, perhaps the first two cases described, although not then suggesting a new clinical entity, were those of James Whitney[4] in 1906, published in the Boston Medical and Surgical Journal. On this coast Harold Hill and Philip King Brown of San Francisco published cases a number of years before the disease as an entity was established, which, from the description, would seem to fit the picture. Altogether there have been reported about one hundred and fifty cases, of which very few indeed show any ocular complication. Although in a few, mention is made of an injected conjunctiva, such as might be found in any nasal or oral inflammatory condition, I find only twice an ocular complication of severity mentioned. A herpes of the cornea and lid occurred in one, in the other a necrotic conjunctivitis is described, without, however, any further mention of the fate of the eye. Before describing the case in question, although full descriptions of the typical findings of the disease are to be found in the literature, it might be in place to give a short review of the main features of agranulocytic angina.

The symptomatology was well described by Schultz in the first six cases published by him. These were in middle-aged or old women with a necrotic, rapidly advancing degeneration of the mucosa of the pharynx, cheek, and tongue, together with jaundice, and with a generalized septic prostration in the absence of polymorphonuclear leucocytes, almost without exception ending in death. The symptomatology of these cases put into a concise form might be described as a febrile condition which, in its acute stage, is frequently associated with herpes. The oral and throat changes show conditions ranging from a simple angina lacunares to the most severe necrotic ulcers covered with a diphtheritic membrane, beneath which a rapidly devouring necrosis takes place. Paratonsillitis is often seen. Characteristic is the great frequency of gingivitis. It has been noted in a number of cases that dental work has preceded the onset of the angina, the patient having had a tooth extracted, or having been treated for a gingivitis. Harold Hill[5] has recently drawn particular attention to this coincidence. The posterior pharyngeal wall and even the larynx may be affected without, however, the formation of dangerous laryngeal stenosis. The esophagus, the stomach, and duodenum may show fine, small, ulcerating processes as may the ileum, colon, rectum, and vagina.

The patients are of the female sex in about eighty percent of all cases and usually range in age from twenty to

forty years, although any age may be susceptible as was the case in our patient who was seventy-three. The mode of the onset is nearly always acute, although prodromal symptoms of general malaise occasionally may precede its inception. The initial symptoms are high fever, sore throat, general illness, and difficulty in swallowing. Jaundice occurs in at least one half of the cases. Chills, headache, vomiting, and general muscle-pains may occur. The patient usually looks severely ill. Some patients, however, fail to betray by their general appearance the nearly hopeless prognosis which lies ahead. The sensorium is particularly clear. A feeling of exhaustion is common but the mind is quite normal as a rule, until just before death, when coma may supervene. Death in the majority of cases is a result of a hemorrhagic bronchial pneumonia. Some cases may have ups and downs recovering from one attack only to proceed to another and this may continue over a number of years. The disease is characterized by a typical blood picture. There is an almost complete absence of polymorphonuclear leucocytes with a total white count as low as or lower than 1000 per cubic centimeter, and with this relatively no disturbance of the erythrocytic and thrombocytic apparatus.

In our present knowledge, or lack of knowledge of the primary cause of this disease we may for the time assume that a chain of events of about the following character takes place: A case of pure agranulocytosis is one in which an unknown factor disturbs or destroys the producing apparatus of granulocytes in the bone marrow; the possible absence of a hormone essential for the vitality of bodily tissues causes a lack of response of these tissues, perhaps especially of the mucous membranes to casual smaller traumas, or under such conditions the membranes may be attacked by bacteria otherwise existing as saprophytes in these regions.

Case report. Mrs. F. G. entered Stanford University Hospital, January 11, 1932. She was a German housewife, aged seventy-three years, senile and querulous. Her family history was of no consequence. Her eyes had been sore, the lids swollen, and there had been a mucopurulent discharge for ten days preceding her admittance. She had had swollen and sore eyes twice before, two years and one year previous to her admission. On December 22, 1931, the patient developed an acute nasal discharge, sore throat, cough, and fever. A week later, the left eye became sore, red, and swollen, followed by the right eye on January 3, 1932, so that on admission to the hospital she could open neither eye. The throat showed acute

Fig. 1 (Barkan). Ocular involvement in a case of agranulocytic angina.

pharyngitis and tonsillitis; there were some diseased, dirty teeth; the lips were dry without ulceration or herpes; the tongue surface was caked with yellow patches of mucus. The uvula showed a yellow ulcerated patch with a surrounding diffuse stomatitis. The physical examination, except for the above, was practically negative. The first blood count showed: red blood cells 4,290,000; hemoglobin 70 percent; leucocytes 1000 per cubic centimeter; polymorphonuclears 0; lymphocytes 97; large mononuclears 2; transitionals 1. The urine was heavily loaded with albumen and sugar. The blood findings during the next week averaged, polymorphonuclears 0-1; lymphocytes 83-93; large mononuclears 6, 16; transitionals 2. By January 18, 1932, she was decidedly worse. The tongue was dry, and there were deep punched-out ulcers on the lateral margin of the uvula. The left anterior pillar, arytenoids, and interspace were covered with an edematous dirty membrane extending over the cords down into the trachea so that a tracheotomy set was always kept in

readiness. Following treatment with pentose nucleotids intravenously the patient was decidedly better. On January 25, 1932, the blood was as follows: polymorphonuclears 57, lymphocytes 27; mononuclears 13. Following this treatment there was a sharp drop in her temperature to almost normal, the blood culture remaining negative as before. In spite of the general improvement there was an edema of the larynx and trachea with marked stridor. By January 30, 1932, the leucocytes were 6,100, polymorphonuclears 81, lymphocytes 11, mononuclears 7. The patient, who for the first two weeks was not expected to live, was now recovering nicely, but throughout all this period the ophthalmic findings had increased in severity of process, leading finally to complete blindness. The original edema of the lids and conjunctival discharge became progressively worse. Ten days after admission simultaneously and bilaterally the corneae showed beginning ring abscesses which progressed until both corneae were entirely necrotic. The right cornea perforated over its entire extent at practically the same time, but did this so slowly and evenly that the iris, covered by organized exudate, occupied the plane of the cornea with almost no bulging. In the left eye there was a marked protuberance in the corneal area which now was occupied by a projection of the entire iris in globular form covered by exudate. In neither was there any expulsion of the lens or increase of tension to the finger. Unfortunately this woman recovered from her agranulocytic angina to continue life as a blind individual. The pathology of ring abscess is well known. It begins with a necrosis of the endothelium of Descemet's membrane and proceeds from the posterior layers of the cornea forward to the anterior layers in a circular peripheral ring. It is believed that severe toxins acting upon the cornea in this fashion, and brought into its vicinity by aqueous and the circumcorneal-blood circulation act as toxic agents. The question arises as to the etiology of this bilateral ring abscess. It is conceivable that the primary mucous-membrane lesion in this case was the conjunctiva. The ring abscess was, I believe, the result of the general toxic condition of the patient. While this case is so rare that a similar one may not occur again in the course of a great many more cases of this disease, it will be well for us as ophthalmologists to bear in mind that ocular complications such as herpes corneae, necrotic conjunctivitis, and ring abscess may occur in agranulocytic angina. We might also bear in mind that in the occasional very severe cases of chemosis of the lids and violent thickening and secretion of the conjunctiva with no evidence of any other disease a differential white count would be indicated.

The ocular complications in this disease are not, as far as I am aware, described in any textbook of ophthalmology. It is for this reason that I have thought the presentation of an isolated case to be worth the attenion of this Society.

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INOCULATION OF THE HUMAN CONJUNCTIVA WITH TRACHOMATOUS MATERIALS

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The report of a case of trachoma experimentally induced in a human subject who had previously been inoculated with Bacterium granulosis several times, in an attempt to test its pathogenicity for the human conjunctiva, with negative results. The case here reported ran a typical course, developed pannus, was positive for Prowazek-Halberstaedter bodies, and resisted treatment. From the laboratories of the Pasteur Institute of Tunis and the Department of Ophthalmology, College of Medicine, State University of Iowa.

Trachoma is generally considered to be a specific, communicable disease. The experimental inoculations of Sattler[1], Addario[1], Greeff, Frosch, and Clausen[1], Miyaschita[1], Peters[1], Lumbroso[2], Nicolle, Cuénod, and Blaizot[1], Michail and Vancea[3], and Taborisky[4], as well as numerous reports of accidental infections occurring during surgical procedures on trachomatous eyes, would seem to have established its communicability beyond doubt. A certain number of authors[5], however, continue to question it, and it therefore seems desirable to report in detail the following experimental inoculation.

A blind Arab boy, seventeen years old, having normal conjunctivae, was inoculated in the right eye with trachomatous material. He had previously been subjected to repeated subconjunctival inoculations with fresh strains of Bacterium granulosis with entirely negative results, and the present experiment was performed to determine his susceptibility to trachoma. His youth and the fact that he was suffering from an advanced nephritis made him an especially suitable subject. The fatal prognosis eliminated the necessity of terminating the disease before definite diagnostic signs should be manifested.

Material for inoculation was obtained by curetting the conjunctiva of a young Arab adult with trachoma IIa. There was no purulent secretion or other evidence of secondary infection. The curetted material was suspended in 5 c.c. of sterile normal salt solution and divided into two equal portions. One portion was used for the inoculation of the young subject, thus: after cocaine anaesthesia, the tarsal conjunctiva of the upper right lid was lightly brushed with an applicator that had been soaked in the suspension. Half an hour elapsed between the curettement and the inoculation. The other half of the material was used for inoculation of various types of culture media and, after centrifugalizion for preparing films for direct examination.

Clinical Course of the Experimental Disease

The first signs of disease appeared on the sixth day. There was ptosis, marked edema, and a rather abundant mucopurulent secretion. The palpebral conjunctiva was markedly reddened and edematous; the bulbar conjunctiva remained relatively pale. The acute symptoms rapidly subsided and by the twelfth day the disease had become chronic. There was little secretion. Considerable papillary hypertrophy of the tarsal conjunctiva was observed. On the sixteenth day definite follicles appeared at the upper border of the tarsus. Tarsal follicles developed soon after and the conjunctiva of the upper fornix was thrown into folds. Follicles also appeared on the lower lid.

On the twenty-sixth day after inoculation of the right eye, the left eye, which had been treated prophylactically with instillations of collargol twice daily, presented immature tarsal follicles characteristic of trachoma stage I. There was no noticeable secretion nor swelling of the lids.

In subsequent examinations the right eye presented the typical picture of florid trachoma. Characteristic follicles were scattered over the upper tarsus

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and in the fornices, and papillary hypertrophy was more marked. The disease in the left eye, on the other hand, progressed slowly and retained the appearance of trachoma I. Papillary hypertrophy was minimal. A few mature follicles were observed in the upper fornix and along the upper edge of the tarsus. A small amount of mucoid secretion was present in both eyes in the mornings.

By the fifty-fifth day the disease in both eyes had become so characteristic that no hesitation was felt in making a diagnosis of trachoma. Instillations of collargol twice daily and daily applications of the copper-sulphate stick were begun. The disease proved resistant to treatment and after two months neither eye showed any marked improvement. Three and a half months after inoculation there was definite pannus in the right eye; examination under magnification showed vascular loops penetrating about 3 mm. into the cornea.

BACTERIOLOGICAL FINDINGS

Original Trachomatous Material

One half of the original trachomatous suspension was used for the inoculation of various types of culture media, including twelve tubes of semisolid leptospira medium, six tubes of "K" medium, and twenty freshly prepared plates of blood agar containing carbohydrates. The tubes were each inoculated with one drop of the undiluted material. The remaining material was centrifugalized and used to prepare slides which were stained by both Gram's and Giemsa's methods.

The films showed very few bacteria. There were a few clumps of Gram-positive cocci and a small number of minute Gram-negative bacilli. The latter appeared to bear a close morphological resemblance to Bacterium granulosis.

The cultures yielded only three bacterial types. They were obtained entirely from the tubes as the plates were found to have been contaminated during preparation and had to be discarded. The "K" medium grew a corynebacterium, identified as C. xerosis, and a white staphylococcus; the leptospira medium grew these two types and in addition a small bacillus, morphologically identical with that seen in the film preparations. This will be described later as T122.

Material from the Experimental Disease

Film preparations. Epithelial and secretion films were prepared from the inoculated eye on the sixth day and at frequent intervals until the fifty-fifth day. From time to time films were also made from the left eye after it had become involved.

Films from the right eye made on the sixth day revealed numerous small, slender bacteria having the general appearance of Koch-Weeks bacilli, only somewhat smaller and staining more intensely. They were found in and outside the leucocytes but had not attacked the epithelial cells. They continued to be numerous during the period of acute symptoms but diminished in number as the secretion diminished in quantity. After the thirtieth day they could not be found. They were never seen in films from the left eye.

Typical trachoma inclusions were seen in Giemsa-stained films from the right eye from the thirteenth day, and from the left eye after it became affected, until treatment was instituted. They were not present in large numbers but were found consistently and without difficulty.

Cultures. The first cultures were taken on the twelfth day. Conjunctival scrapings were used to inoculate blood-agar plates, tubes of leptospira medium, and chocolate-agar tubes. C. xerosis, various types of staphylococci, and two types of minute bacilli, T124 and T126, were recovered. One of these, T126, resembled closely the T122 recovered from the original material. The other was a rapidly growing organism producing yellow pigment and belonging to a type frequently found in Tunisian trachoma. No Koch-Weeks bacilli were found, although the acute onset of the experimental disease had suggested the possibility that this bacterium was involved in the infection.

Both eyes were cultured at weekly intervals until treatment was begun. The results were essentially the same. The two types of minute bacilli were recovered consistently from the right eye but at no time from the left.

Characteristics of the minute bacilli. One type of minute bacillus, T124, was characterized by its profuse growth on all ordinary media and by the production of a canary-yellow pigment. In broth, a considerable amount of mucin was formed. No sugars were fermented. The bacillus was actively motile under all conditions. Morphologically it bore a decided resemblance to Bacterium granulosis but was easily differentiated from it biologically and serologically. It showed no pathogenic action when tested on the normal conjunctivae of man and monkey.

The other type, T122 and T126, while morphologically similar to T124, had quite different biological characters. It was nonmotile, less definitely Gram-negative, and grew poorly on blood-free media. Its growth on blood agar was at first mucoid and greyish but later became greenish yellow. On plain agar a definite yellow pigment was formed. A number of carbohydrates were slowly fermented. These bacilli displayed some similarity to Bacterium granulosis, but were definitely distinguishable from it on a serological basis. No agglutinins could be found for them in sera from active trachoma cases, and they were nonpathogenic for the normal conjunctivae of man and monkey.

Significance of the minute bacilli. Small bacilli have been found with considerable frequency in trachoma in various parts of the world[6]. They have undoubtedly been confused with Bacterium granulosis by a number of workers. In general they have been found to be devoid of pathogenicity. Recently I[7] reported finding similar bacteria in plates exposed to the air and suggested that many of the minute bacilli found in trachoma are really air bacteria which have lodged incidentally on the diseased conjunctiva.

Summary and conclusions

Trachoma was produced experimentally in the normal human eye as the result of inoculation with materials from an active case of the disease. Acute symptoms developed in the inoculated eye after an incubation period of six days. In twenty-six days the uninoculated eye became involved. Minute bacilli were observed in films made from the original material and in films from the experimental disease, and two types of minute bacilli were recovered in culture. They resembled Bacterium granulosis in certain respects but could be differentiated from it morphologically and culturally. They were without pathogenicity and probably were saprophytes derived originally from the air. The inclusion bodies of Prowazek and Halberstaedter were characteristic of the experimental disease.

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VISION FOR EQUILIBRIUM AND ORIENTATION

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This paper reviews the important elements that contribute to our recognition of our relations to surrounding objects, and that help to maintain posture and equilibrium. Each element may be of major importance in some of the lower animals. But with perfected macular and binocular vision, the space perception it gives, and our close coordination with essential muscular actions, sight becomes the dominant factor in maintaining equilibrium. Read before the Pacific Coast Oto-Ophthalmological Society meeting at Seattle, June 29, 1932.

In the simplest organism the contact of something with the surface influences the interior of the protoplasmic particle, so that it changes shape, or position. The protoplasm then moves so as to include the particle, if it is food; or to get away from it, if it is injurious. Such an organism seeks food when it is needed to maintain or restore the nutritive equilibrium. Our subject is considered as to its dependence on vision; although, in this opening age of aviation, we cannot ignore the importance of the semicircular canals.

From touch or contact with material stimuli have developed taste, smell, and hearing; and, still not entirely differentiated from touch, we have sensations of localization, temperature, weight or pressure, and pain. Sight results from a stimulus not by material contact, but by electro-magnetic vibrations coming from a distant source. The sensation of heat is caused by the effect of such vibrations on substances in touch with nerve endings. From the simplest organism up to man, the perception of relations to external objects, orientation, and the power of preserving an individual balance, equilibrium, have developed together, giving rise to reactions and defensive mechanisms necessary to the continuance of life.

Originally the whole surface could perceive impressions, and the whole mass of protoplasm could transmit them, and react to them. With the specialization of tissues and functions, certain parts became better fitted, and more engaged in orientation and balancing, but the fact remains that the body is widely involved, and dependent on their performance. No real understanding of them can be obtained if it is assumed that they arise entirely from a limited tract of the nervous system, and involve only a few organs. Something may be learned from the developed senses of lower animals, but human orientation and equilibrium present problems and developments very different from those of other vertebrates.

Taste, smell, and hearing warn of proximity; and the latter of direction. Touch and sight are universal servants of orientation and equilibrium. Physical contact makes itself known under all circumstances. Light extends our orientation to objects not known by contact. There is another universal force that all living things have to take into account, but it is not sufficiently considered, because it does not appeal to any one special sense organ. This is the attraction of gravitation, which acts constantly in all situations, on every particle of matter. Equilibrium might be called keeping the balance of gravity acting on all the different parts of the body. Gravity always has been important, underlies much of the development to secure equilibrium, and so far as we can now see, will always be important in our planning to secure and maintain equilibrium. Its universal existence and uniformity, and our knowledge of some of its laws, suggest that it may be still further used, as in "blind flying," for a general means of orientation.

The general consciousness of the danger of falling, in all young animals, suggests instinctive familiarity with gravitation. The young colt staggers up on its long, thin legs, to get its first nourishment. Instinctively the young bird keeps close in its nest, even when

stretching its neck and mouth for its share of food. The young monkey, or baby, can hold up its weight, by the firm grip of its hands, very soon after it is born. The child, undertaking to walk, very quickly directs its attention to keeping the upright position against the constant drag of gravity to bring it down; and it quickly appreciates the help it can get by holding on to a finger of the extended hand. Probably deep down in our mechanism and coordination of balancing is embedded a consciousness of the continuous pull of gravitation; that is really the foundation upon which all the results of experience in balancing are built. Some new method of testing and supplementing may give us the mastery of aviation that will ultimately justify the title of "bird men." Closely connected with it must be the muscle sense, for which we have a name, but of which we know so little.

When the lancelet came from crawling in mud to free swimming in water, new problems of orientation and balancing were encountered. An enormously important organ was developed in the semicircular canals. These are thought of as a part of the ear, but might well be considered the original organ from which the ear has developed. Living in water that touched the whole surface with almost equal pressure, but subject to great variations in swift currents, the fish had great need for a compass that would keep the true direction of the attraction of gravitation under all circumstances. In the cartilaginous fishes, like the sharks and rays, the semicircular canals are still of relatively enormous size. Sewall[1] used them for physiologic experiments, as very much better adapted to the purpose than the pigeons used by Fluorens, or the other laboratory animals commonly used. In more than ninety of these fish he opened the ampullae and canals. "In all the instances the results of experiment were more nearly negative, the more neatly the operative manipulation was performed." He found that "the most extensive lesions of the labyrinth and its nerves may be completely devoid of any effects upon the equilibrium of the fish, it would be bold assumption to consider the apparatus a special sense organ, in the usual acceptation of the term, for the preservation of the equilibrium of the body."

Within the last year, from his experimental studies of the labyrinth of the frog, McNally[2] reports: "The frog's righting reaction is independent of the utricle, or of any other special part of the vestibular mechanism and is present so long as any one canal or utricle is intact to initiate the reaction." At the same meeting Dr. R. A. Fenton[3] pointed out: "The vestibular function no longer holds the commanding position in aviation examination which it did during the war." "The turning chair is no longer used." He quotes from a recent circular of the Royal Air Force, "it was found that the reactions to rotation might be excessive in some individuals, and diminished in others; but in neither case did the reactions of the vestibular apparatus seem to indicate an airman's probable flying ability."

Arising from an involution of the epiblast, and carrying the epithelium, hairlike structures, tactile, and thermal capacities of skin, its internal surfaces facing in every direction, its otoliths, its endolymph and perilymph, influenced by pressure and motion, the labyrinth may well be regarded as a portion of the sensitive surface, set apart and protected for special sensory functions. It may well be that its primary function was to furnish data for orientation and equilibrium, especially with reference to the direction of the attraction of gravitation. With the cochlea, a later outgrowth from the semicircular canals, the auditory function may well have been a later specialization from the function of orientation and balancing.

There can be little doubt that in the human being vision makes the most general and important contributions to orientation and equilibrium. The lancelets had eye spots—a rudimentary lens with pigment cells at the end of the optic nerve—when there was no trace of organs for hearing, nor any rudiments of semicircular canals. But only

human beings, completely developed, have powers of orientation and equilibrium as we know them. The eye of the nautilus has a field of vision, light being admitted to the cup that is lined by the retina, through a very small aperture (Huxley[4]).

Retinal orientation may be quite primitive. It is very serviceable in driving an automobile. The driver, keeping his eyes fixed directly ahead, notices the image of an automobile coming on a cross road, or street. If the image of that automobile approaches to the foveal image of the point on which the driver's gaze is fixed, it will reach the point of intersection of their paths before he does. If its image gets farther from his fovea, he will reach the point of intersection first. This method of orientation may well be available to animals that have no specialized macula, and no field of binocular vision. Each independent field of vision, belonging to eyes placed laterally on the two sides of the head, may possess this power of orientation.

Orientation and the equilibrium based upon it were greatly assisted by the moving of the two eyes to the front of the head and the development of exact binocular coordination. Accurate macular discriminative vision required that binocular motor coordination should be accurate. Sensory and motor precision each stimulated the development and refinement of the other; and the two together furnished the basis of the greatest exactness of visual orientation. This also favored, if it did not compel, more definite and exact orientation and true equilibrium by means other than visual.

In discussing orientation and equilibrium, attention has been fixed chiefly upon the relation of the body to outside objects and forces. Their more important part has to do with the relations of different portions of the body with each other; its means of internal communication. The working of the primitive power of protoplasm to originate and transmit the impulses which cooperate in securing and using the knowledge of surroundings, needed to preserve life, is buried so deep in the natural history of vital processes that it is out of the reach of consciousness, even when its results influence consciousness most directly. Little has been gained by experiment on lower animals, even by the most carefully planned and successful experiments on the nervous system.

What does seem positive is that our practical results in knowing where we are and keeping our balance are gained by combination and coordination of a wide rage of impressions, from outside the body, or within it. This fact needs to be emphasized. After a century of discovery and assignment of separate functions to different organs and bodily systems, most mistakes have been made by regarding as local, functions that are general. This has certainly been true of orientation and equilibrium. Our safety largely depends on the localized field of vision, based on retinal function. The life of the deer or rabbit may depend on the perfect functioning of their olfactory organs, but it also depends on the cerebral connections that translate alarm into swift leaping and running. The connection of sensory and motor nerves in the basal ganglia of the brain that results in flight, or in quick judgment, and in nice selection among risks, is also an essential element in utilizing the evidence of danger.

An extremely important element in our internal mechanism for orientation and balance is the muscle sense. We know there are sensory, or afferent nerves arising in muscles, tendons, and joints. But the essential part they take in orientation and balancing has not received much attention. They certainly furnish subconscious information, on which our conscious actions of motion and balancing are based. For conscious orientation and equilibrium the unconscious stimuli and movements are basic and essential. These unconscious elements are liable to certain derangements, and on that account are of practical importance. Pressure on a nerve trunk may greatly impair its function for the time. On this account the muscle sense in one leg may be greatly impaired, while that in the other has quite its usual quality. Certain conditions, as acidosis, may prevent normal nerve action, and thus interfere with the equi-

librium. The influence of alcoholism, and its different effects on different individuals and at different times, is a matter of common knowledge.

The tottering gait of the old man is as much a failure of nerve coordination as it is of muscle weakness. It may be from sitting too long in his arm chair, with pressure on a sciatic nerve already impaired by "rheumatism." The "support" of a cane is generally, as it is for the blind man, an additional point of touch to reinforce the coordination which is the essential basis of his equilibrium. A hand-rail up a stairway gives the same kind of assistance. Even if it is used to pull up by, the tension of the arm muscles, the muscular sense, the afferent impulse from the sensory nerves of the muscles, tendons, and joints, is a great help to steadiness. But the great, guiding, directing influence, in the coordination that gives equilibrium is sight. More frequently than ophthalmologists realize, failing vision, or confusion in vision, is the cause of loss of balance from age. Half of the blind in the community are over fifty-eight years of age; and the number who feel age in their poor sight is larger than we realize.

Many whose vision has gone below 6/12 do not speak of it. Such vision ceases to be the dominant, or controlling factor in keeping one's balance. It is rather an added source of confusion. Rising suddenly from bed at night, or even turning the head suddenly in the dark, disturbs the otoliths and hair-like elements of the labyrinth, so that without the steadying influence of vision there is loss of equilibrium. The muscle sense is also disurbed at such a time. Between the two one may find one's self turning to one side in the dark, or falling forward, quite unconsciously. When the light is turned on this tendency at once disappears. Even catching a glimpse of the side of a door, or of some lighted area, such as the sky, will soon end it. Touch and recognition of a door frame will stop it. Patients often speak of such an occurrence as getting "confused", without knowing the cause or nature of the confusion.

The influence of the muscle sense in orientation, in recognizing and defining the position of the body with reference to neighboring objects, depends largely on habit, development of certain attitudes, or movements; or upon previous, recent orientation of the same, or similar objects. Suppose one sits on the rear end of a moving train, and watches the continuous succession of rails, ties, fence posts, bushes, trees, or buildings, going away from him and the things immediately around him, all at the same speed. Suppose that the train quickly stops, and all these objects in the field of view, cease to recede. The change in the rate of apparent recession promptly makes itself felt in a sense of relative approach, as if all these objects were coming toward the train to overtake it. The exercise of bending the body first to one side then to the other, twisting so as to touch the floor with one hand, while the other hand is held aloft, causes an object, behind one, or above the head, to shift alternately from side to side, in the general field of vision. This experiment can be repeated a dozen times in quick succession, without any loss of the apparent movement of the object in question.

The fact that orientation is a coordination of all sorts of sensory impressions, may be illustrated in many ways. If, by previous experience, or practice, we are able truly to coordinate all these different impressions that are present in consciousness at one time, and can fully harmonize, or unify them, we arrive at a true orientation and equilibrium. If some impressions are present which do not harmonize and confirm, but contradict each other, confusion arises. A child in an elevator finds its usual orientations with reference to the attraction of gravitation greatly disturbed, and is terrified. Some persons in swinging have their otolith impressions from the labyrinth so disturbed that they get sick. Most people experience such disturbance in a sea voyage. It was a narrow view of physiology that ascribed seasickness entirely to a disturbance of the "eye muscles."

In a shower bath all parts of the body are bombarded with impressions of touch, pressure, and temperature. In the dark, or with the eyes closed, these unusual sensations are often confusing

and one staggers, or gets uncertain of position. But if the eyes are open and there is a good light, the steady visual impressions of the surroundings quickly bring the other impressions to order. The same steadiness and equilibrium may be maintained with the eyes closed, or in the dark, by planting the feet firmly and standing still. By fixing the impressions of the muscle sense, the rush of drops of water against the body surface will lose its power to disturb the equilibrium.

In the salmon, swimming up-stream, by violent exertion of different muscles to meet varying currents and avoid rocks, its orientation and balance must be kept true by the constant action of gravitation on its internal labyrinth. In the human being, vision, putting him in touch with objects near or far, in present or past experience, is the sense that brings the most constant and general awareness of different bodies, or forces, to which he must keep himself adapted.

We still possess and can utilize the different forms of apparatus that furnish the data for orientation and equilibrium in the lower animals. But the human nervous system and its coordinations are chiefly developed with reference to the sense of sight. Touch, the muscle sense, the internal organ of touch that keeps us in relation with gravitation, are all available at any time to correct or supplement vision. But vision has succeeded to the commanding position, among the wide range of functions that are ready to assist in orientation and the maintenance of equilibrium.

1120 Republic building.

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THE SCOTOMETRY OF RETINAL EDEMA

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Retinal edema although mainly due to venous stasis depends also on other concomitant factors. A differential diagnosis is of great importance, therefore, and this can often be obtained by evaluating the form of the vascular shadow. Read before the American Ophthalmological Society, New London, Conn., June, 1932.

The object of this paper is to present a series of studies on an apparent relation of retinal edema to certain defects of the central visual field. Little will be said of the technic used. The procedure previously described[1, 2] for angioscotometry was strictly adhered to. This means that conditions were carefully standardized by using the Lloyd stereocampimeter illuminated by artificial "daylight" of 15 foot candles. The fixation distance was 190 mm. and the minute spherical objects, described elsewhere[3], were used as stimuli. The eighty-two cases accepted for these studies were carefully culled from about one thousand records of cases from private practice. As far as possible, no material was included in which more than one factor was a likely cause of the defect. A theoretical consideration of the mechanism which produces these scotomas is too elaborate to review at this time. A special contribution has been devoted to its discussion[4]. Suffice it to say that the synapse and perivascular space relations are the basis of interpretation.

The material for the present study is presented in three groups. We shall call the first of these **experimental evidence.**

When, a few years ago, a number of workers[5, 6, 7, 8] demonstrated that under certain conditions scotomas underwent transient widening, a new field of research was opened. The phenomenon is typically demonstrated with superficial compression of the neck. The finer, more closely related, peripheral branches of the scotoma widen so that adjacent shadows blend, blotting out the more peripheral field; the blind-spot of Marriotte increases in size; and later the papillo-macular vessel shadow widens to such a degree as to blur central vision. The appended illustration of a typical study (see Fig. 1) should help to make these points clear. (This experimental material was composed of thirty-four individual chart studies.)

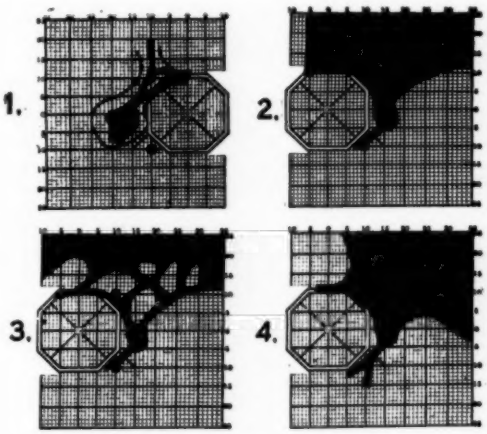

Fig. 1 (Evans). D. W., April 19, 1932. Compression of neck. No evidence of pathological changes, ocular or general. Change in blind-spot and angioscotoma. Sphygmomanometer cuff about neck and pressure maintained at 40 mm. Hg. for about five minutes. Object .51 mm./190 mm.

Fig. 2 (Evans). E. J., May 3, 1932. Before rest and meal. No pathological evidence, general or ocular. Vision, O.U. equals 6/4 uncorrected. Object .37 mm./190 mm. Blood pressure 105/75.

Fig. 3 (Evans). E. J., May 3, 1932. After rest and meal. No pathological evidence, general or ocular. Vision, O.U. equals 6/4 uncorrected. Object .37 mm./190 mm. Blood pressure 118/75.

Fig. 4 (Evans). E. W. A., Jan. 11, 1932. Influence of posture with low blood pressure. Vision O.D. equals 6/4 corrected. Object .51 mm./190 mm. Blood pressure while sitting up 112/80.

Such a disturbance in retinal sensitivity has not been entirely unsuspected for a severe disturbance[9] of the respirations as in coughing, sneezing, running, etc., is commonly known to obscure vision for a short time. Even stooping low with the head held de-

pendent produces the same effect. One sees the superficial veins dilate at such a time and it has been repeatedly demonstrated that both intracranial[10, 11] and intraocular[12, 13] pressures rise un-

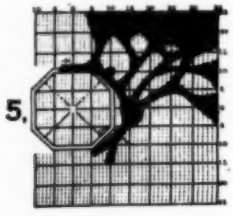

Fig. 5 (Evans). E. W. A., Jan. 11, 1932. Influence of posture with low blood pressure. Vision O.D. equals 6/4 corrected. Object .51 mm./190 mm. Blood pressure while reclining for five minutes 95/75.

der these circumstances[14]. It is easily demonstrated that certain entopic phenomena[15] show a slowing of the blood stream during jugular or ocular compression.

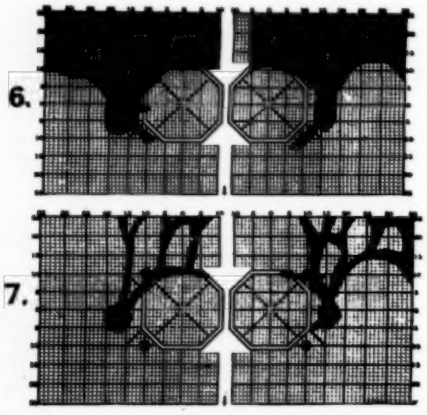

Fig. 6 (Evans). J. S., March 5, 1932. First day of menstrual period. Vision O.U. equals 6/4 corrected. Object .51 mm./190 mm. Blood pressure 100/80.

Fig. 7 (Evans). J. S., April 18, 1932. Between menstrual periods. Vision O.U. equals 6/4 corrected. Object .51 mm./190 mm. Blood pressure 105/80.

We may now proceed to the consideration of what might be called **physiologic evidence.*** Certain studies have shown scotoma formation when the retina is fatigued by light stimulation[8], during the menstrual period (see typical studies, Figs. 6 and 7), and with low blood pressure (see typical studies, Figs. 2 and 3), as after sleepless nights or other mild fatigue. The last would seem to be produced by what we might look upon as a gravitational effect. The inferior part of the retina, and hence the upper field, shows an area of depression which though present in the erect posture (see typical study, Fig. 4) is not detected in the reclining posture (see typical study, Fig. 5). It is exaggerated when the head is at a lower level than the trunk[8]. The mechanism of these changes is perhaps analogous to the swelling of feet after many hours of standing. This peculiar vulnerability of the retina may perhaps arise from the terminal character of its circulation and the probable absence of valves in the veins.† The inadequacies of our circulation have been studied by Turner[16] who emphasizes the fact that the erect position being phylogenetically recent, the circulation is not perfectly adapted. In both transient and protracted retinal stasis there is a slowing of the blood stream with distension of the veins, but with more acute stasis, and particularly with compression of the jugular veins‡ there is a rise of intracranial and intraocular pressures.§ In fact we are apparently producing a sort of minor edema of the papilla (choked disc) and retina, as would appear from a consideration of charts where the blind spot and angioscotoma are both enlarged.

Before proceeding with the presentation of **evidence from pathologic material** we must recall that edema in the pathologic sense of the word is the product of a very complex series of events[17]. The main features in its

* The physiologic group was composed of eighteen separate chart studies.

† I do not recall that the absence of valves in the retinal veins has been demonstrated, but I think this is surely so if the analogy of cerebral and retinal vascular systems holds true.

‡ It is obvious that other vital structures in the neck may be influenced by the compression so that this mechanism may be most complicated.

§ Consideration of the scotometry of increased intracranial and increased intraocular pressure is too elaborate for inclusion in this study.

mechanism, according to McLeod[18] are: 1. Diffusion pressure. 2. Capillary blood pressure. 3. Osmotic pressure of blood proteins. 4. Differences of electrical potential. 5. Variations in the permeability of the membranes concerned.

It is obvious that we cannot relate scotometry to these various entities nor would it be desirable could we do so, for the clinical aspects of the present studies would become obscured by the effort.

It is significant however to recall a statement from the classical studies of Barlow[19], who says: "Edema is mainly due to two factors: 1. The starvation of the tissues by loss of the nutrient blood supply; and 2. Accumulation of waste products of their own metabolism. . . . The amount of lymph which escapes from the vessels is determined by the needs of the tissue rather than by the condition of the vessels." When looked upon in this way, the increase of tissue fluid in pathologic conditions is simply an exaggeration of the physiologic.

The main factor emphasized in the production of the defects just reviewed is venous stasis, but it is equally obvious that a great many less conspicuous influences should be considered in the final analysis. Nevertheless venous stasis and its associated phenomena are common to all. The call of the tissue for an excess of fluid follows venous stasis very promptly in the retina. This is necessarily so when we recall the high rate of retinal metabolism. To be sure the nerve fibers in general can be deprived of oxygen for quite a long interval and still recover, but the synapses are much more sensitive[20]. We know from a vast amount of experimental work that the conductivity of the synapse can be altered by many agents and conditions[21]. The most classical of these are strychnine, nicotine, lack of oxygen, and particularly fatigue. In fact the susceptibility of the synapse to fatigue apparently plays a major rôle in safeguarding the very delicate structures of the visual apparatus by allowing an interval for the removal of waste.

Moderate degrees of circulatory insufficiency[22, *] would present an easy step toward angiopathic retinal disease and produce, as the appended typical study will show (see Figs. 8 and 9), a scotoma very similar to those already shown.† It is an exaggeration of the physiologic type. In more advanced cases such a defect would practically obliterate the central field for the minute object, but larger objects would still demonstrate the angioscotoma until such time as the edema became quite massive and easily discovered by the ophthalmoscope. The central field thus furnishes a means of demonstrating the effect of minor degrees of uncomplicated cardiac embarrassment which, according to Yater and Wagener[23] provides no evidence through ophthalmoscopic examination.

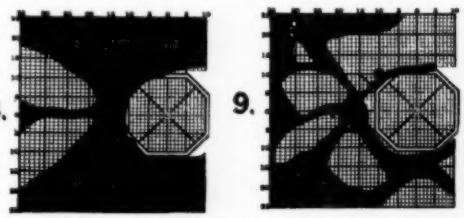

Fig. 8 (Evans). B. N., March 29, 1932. Showing scotoma left eye in case of circulatory insufficiency (cardiac). Moderate edema of face, hands, and feet. Vision: O.D. equals 6/6 — 2 corrected; O.S. equals 6/6 — 3 corrected. Object .78 mm./190 mm. Blood pressure 130/85. Retinal veins slightly distended.

Fig. 9 (Evans). B. N., April 28, 1932. Showing scotoma left eye, after one month's treatment for circulatory insufficiency (fluid restriction and elimination). Definite improvement of symptoms. Vision O.U. equals 6/6 corrected. Object .78 mm./190 mm. Blood pressure 130/90. Retinal veins slightly distended.

Another cause of edema would be a thrombosis of a branch of a vein. Satisfactory study of this type has not been available thus far.

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* Fischer quoted by Wells[22] maintains that the reduction in oxygenation acts chiefly by the increased production of acids which greatly increase the affinity of the tissue colloids for water and at the same time alter the colloidal state of the capillary endothelium and thus increase capillary permeability.

† There were three separate cases studied in this group.

Closure of an arterial branch—the only case of this type yet studied—showed an interesting map (Fig. 10). The edema was evidently called forth from the veins of the region by demand

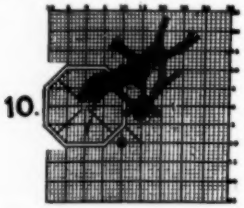

Fig. 10 (Evans). J. S., Aug. 10, 1926. Closure of infra-macular arterial branch. Vision O.U. equals 6/4 uncorrected. Object 1.5 mm./190 mm. Blood pressure 110/70.

of the affected area. It is interesting that central vision was unaffected as the tendency of the fluid was to seek the area of the closed vessel. There was of course no central scotoma. A more massive edema would probably have occurred had the concomitant vein been occluded instead of the artery. The macular region would have been invaded in that case. Aneurysm causing pulsating exophthalmus (Figs. 16, 17, and 18) is quite similar to branch closure in its relation to retinal edema.* Compression of the carotid artery on the side of the proptosis causes the enlarged blind spot and associated shadows to return to normal. This occurs

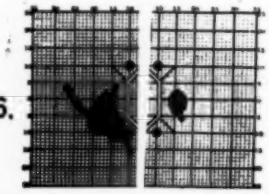

Fig. 16 (Evans). J. S., Dec. 9, 1925. Retrobulbar aneurysm. Scotoma for right and left eyes. Left pulsating exophthalmos 3 weeks after slight indirect trauma. Vision O.U. equals $6/6+2$ uncorrected. Object 1.5 mm./190 mm. Nervehead O.S. hyperemic; veins greatly dilated. Exophthalmometer at 100 equals: O.D. 16 mm.; O.S. 24-25 mm. Marked bruit.

within three minutes after compression is started. In the case cited, ligation of the common carotid on the affected side permanently maintained the normal appearance.

Detachments of the retina are undoubtedly associated with more or less edema, whatever the actual mechanism of their production may be. Evidence of this is occasionally found by the pres-

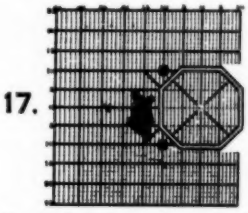

Fig. 17 (Evans). J. S., Dec. 9, 1925. Retrobulbar aneurysm. Showing change in scotoma of left eye on compressing left carotid against cervical vertebra for 3 min. Vision: O.D. equals 6/6 uncorrected; O.S. equals $6/7-2$ uncorrected. Object 1.5 mm./190 mm. No apparent change in eyegrounds. Exophthalmometer at 100 equals: O.D. 16 mm.; O.S. 23 mm. Bruit soft.

ence of a typical defect which corresponds to a region in which no detachment will be found (Figs. 12 and 13). Repeated ophthalmoscopic examinations will, after a number of days, reveal a frank detachment (Figs. 14 and 15).†

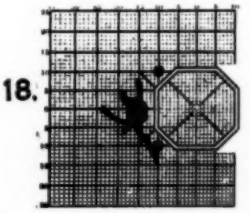

Fig. 18 (Evans). J. S., Dec. 22, 1925. Retrobulbar aneurysm. Showing scotoma of left eye 12 days after ligation of left common carotid. Vision: O.D. equals 6/6 uncorrected; O.S. equals 6/21 uncorrected. Object 1.5 mm./190 mm. "Peach bloom" edema of left retina; veins greatly dilated. Exophthalmometer at 100 equals: O.D. 20 mm.; O.S. 25 mm. No bruit.

The call for excesses of tissue fluid to combat and repair is a common finding when inflammatory processes[24] ‡

* Three cases of pulsating exophthalmus have been studied but only one supplied the full data necessary for a satisfactory study.

† Only one case with this sequence has been studied.

‡ Shade quoted by Wells[24] points out that in inflamed areas the H-ion concentration may be increased to fifty times the normal. This is most significant when we recall that the active retina is already acid in reaction.

are going on. The development of a tubercle immediately adjacent to the nervehead may present the appearance

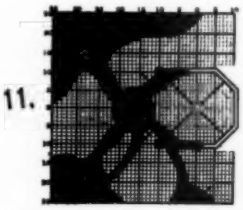

Fig. 11 (Evans). A. G., May 19, 1932. Low-grade, active, peripheral chorioretinitis. Vision O.S. equals 6/6 + 2 corrected. Object .51 mm./190 mm. Blood pressure 110/70. Fine pigmentation of corneal endothelium. Fine floating opacities in vitreous. Peripheral choroiditis, mostly nasal.

of swelling of the optic disc (see Figs. 19 and 20). The scotoma in such a case will be helpful in making an early diagnosis of retinitis juxtapapillaris,

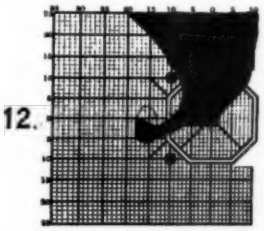

Fig. 12 (Evans). C. McF., Aug. 10, 1926. Detachment of retina. Vision O.S. equals 6/12 — 2 uncorrected. Object 1.5 mm./190 mm. No changes in ocular fundus.

though the classical sector defect of fiber damage may not develop until a later date when atrophy replaces the active changes.§

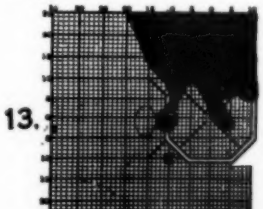

Fig. 13 (Evans). C. McF., Oct. 2, 1926. Detachment of retina. Vision O.S. equals 3/60 + 2 uncorrected. Object 1.5 mm./190 mm. No changes in ocular fundus.

Dilation of the perivascular system in an effort to withdraw waste and supply nutriment is apparently related to the wedge-shaped defects and widened angioscotoma[4]. The fanning out toward the periphery is suggestive of a peripherally located (see typical study, Fig. 11) inflammatory process.* Its accurate interpretation is helped by the discovery of vitreous bodies and slit-

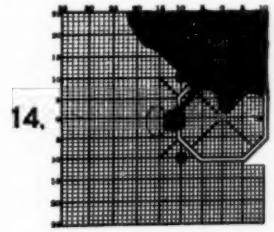

Fig. 14 (Evans). C. McF., Oct. 19, 1926. Detachment of retina. Vision O.S. equals 3/21 — 2 uncorrected. Object 1.5 mm./190 mm. Grayish appearance over corresponding region of retina.

lamp findings of inflammatory products. Such a defect directs careful search of the corresponding peripheral region for ophthalmoscopic evidence of a lesion. A more restricted wedge-shaped defect may persist in the region after the atrophic stage is reached. A study of the defect produced by a centrally located inflammatory process†

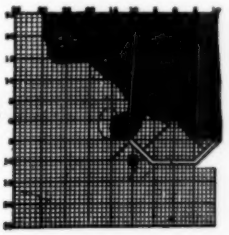

Fig. 15 (Evans). C. McF., Nov. 6, 1926. Detachment of retina. Vision O.S. equals 3/12 uncorrected. Object 1.5 mm./190 mm. Definite detachment of corresponding retina.

shows an interesting relation of the defect produced during the incipient stage (see typical study, Fig. 21) when there is little actual tissue destruction, during the height of the destructive period (see Fig. 22) when inflammatory exudate is present, and during the atrophic stage (see Fig. 23) when the

§ Two cases of choroiditis juxtapapillaris have been studied.

* Seven cases of peripheral type were included in this study.

† Six cases of central choroiditis were included in this group.

defect is the result of tissue loss. Retrobulbar inflammatory disturbances (see typical study, Figs. 24 and 25) such as occur with nasal accessory sinusitis‡, produce quite a typical defect apparently due to the associated edema even

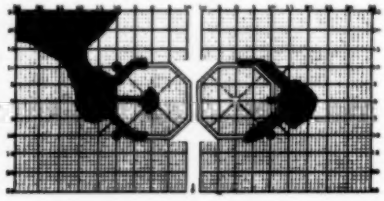

Fig. 19 (Evans). W. F., March 1, 1930. Focal choroiditis, acute stage. Vision: O.D. equals 6/6—2 uncorrected; O.S. equals 3/21+3 uncorrected. Object .51 mm./190 mm. Edema over nervehead and surrounding retina; engorged veins.

when there is little or no ophthalmoscopic evidence of such a process. It is common for the group with the inflammatory process to have low blood pressures so that the defect may be exaggerated particularly when the inferior portions of the retina are primarily involved.

We might proceed with the demonstration of innumerable studies of vari-

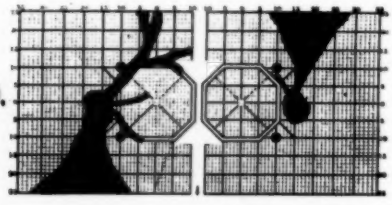

Fig. 20 (Evans). W. F., March 28, 1930. Focal choroiditis, atrophic stage. Vision: O.D. equals 6/6 uncorrected; O.S. equals 6/21 uncorrected. Object .51 mm./190 mm. Eyegrounds: small area of atrophic stage focal choroiditis adjacent to nervehead above; field shows inferior sector defect—nervehead to periphery.

ous inflammatory entities only to find the same general type of map in each instance. The angioscotoma nearest the lesion shows a widening and fanning out so that a characteristic wedge-shaped defect results with its apex toward the blind spot and connected to it by a widened angioscotoma. This finding is most typical in the purely mechanical forms of edema, whereas the classical arrangement is departed from more and more as edema is less and less the dominating factor. It is for that reason that even retinal detachment when established departs from the wedge-shaped form; and when the edema has

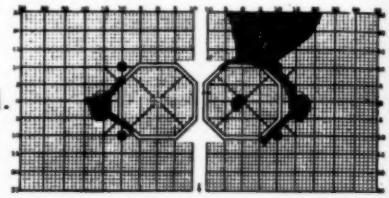

Fig. 21 (Evans). M. G., April 9, 1931. Central chorioretinitis (tubercle) incipient stage. Vision: O.D. equals 6/12 uncorrected; O.S. equals 6/6 uncorrected. Object .68 mm./190 mm. Eyegrounds: macula occupied by minute points of exudate; veins slightly dilated.

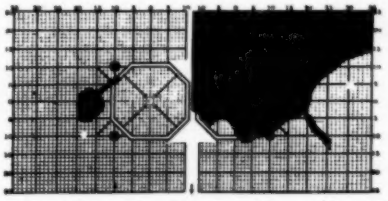

Fig. 22 (Evans). M. G., May 13, 1931. Central chorioretinitis (tubercle) at height of acute stage. Vision: O.D. equals .33/60 uncorrected; O.S. equals 6/4 uncorrected. Object .68 mm./190 mm. Eyegrounds: generalized retinal edema; large mass of soft exudate in the macular region; occasional hemorrhage; veins engorged.

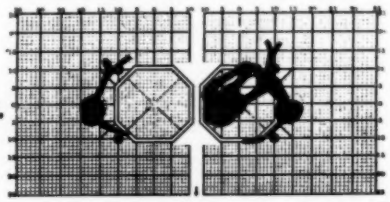

Fig. 23 (Evans). M. G., April 29, 1932. Central chorioretinitis (tubercle) atrophic stage. Vision: O.D. equals 3/30 uncorrected; O.S. equals 6/4 uncorrected. Object .68 mm./190 mm. Eyegrounds: densely pigmented atrophic area in the region of the macula.

‡ A series of studies on this subject is about to be presented in the Annales d'Oculistique under the title of "The Application of Angioscotometry to the Study of Nasal Accessory Sinus Disease." (Seven citations illustrate various degrees of ocular damage as related to the angioscotoma.)

subsided in any case, there is left either the relatively normal angioscotoma or a defect due to atrophy of various and diverse structures.

Wedge-shaped defects are of course not entirely limited to lesions that are angiopathic in origin. The classical quadrant- and hemi-field-defects of pathway lesions are really wedge-shaped defects. As a general rule it is probably safe to say that wedge-shaped defects with the apex pointing toward the blind spot are ocular and angio-

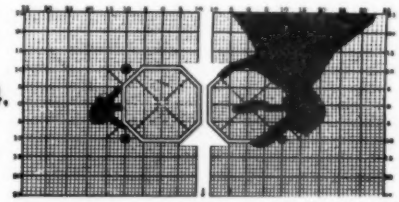

Fig. 24 (Evans). W. M. F., Feb. 18, 1928. Subacute ethmoiditis, before treatment. Vision: O.D. equals 6/15 corrected; O.S. equals 6/7 corrected. Object .51 mm./190 mm. Eyegrounds: nasal edge of both nerve-heads are blurry; slight edema adjacent retina; veins full.

pathic in origin, but where the apex is toward the macula the lesion is primarily in the pathway. The picture is rendered atypical, however, where increased intracranial pressure is superimposed.

In closing this report* it would seem well to emphasize the point that although reference has been made to angioscotometry, it figures only as a basis for interpretation. Its technic is important. The mapping of the scotoma associated with the whole retinal-vessel tree has not been advocated at any

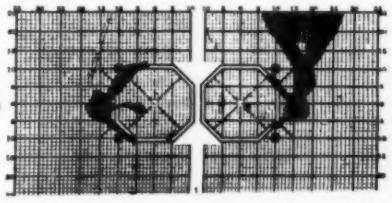

Fig. 25 (Evans). W. M. F., March 5, 1928. Subacute ethmoiditis, after shrinkage and irrigations. Vision: O.D. equals 6/7 corrected; O.S. equals 6/6 corrected. Object .51 mm./190 mm. Eyegrounds apparently normal.

time as a useful clinical study. Angioscotometry was evolved from a great variety of modern studies as a basis for the interpretation of one class of visual-field defects which had previously been referred to vascular disturbances in a vague sort of way.

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* Although four charts are the greatest number illustrating a single study in this report, some of the cases herein presented had as many as twenty charts.

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THE EYES OF SOME FAMOUS HISTORICAL CHARACTERS

Little journeys in ophthalmology—I

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Traveling into the past and studying the eyes of some of the characters that have contributed to the written history of the world, one will encounter many entertaining historic incidents.

In the book of Genesis, writing of about five thousand years ago, there occur the words "And it came to pass that when Isaac was old, his eyes were dim, so that he could not see".[1] Even in that early time the association of defective vision with old age was apparently known. Among the blind characters mentioned in the Old Testament are Jacob[2], Samson[3], Zedekiah[4], and in the Apocrypha, Tobit[5]. Both Samson and Zedekiah had their eyes put out, the former by the Philistines, and the latter by the Babylonians under Nebuchadnezzar. The blindness of Tobit, the father of Tobias, is said to have resulted from a most unusual accident. While resting in the courtyard of his home, the excrement of a sparrow leaving its nest dropped into his eye.

In the New Testament[6], repeated mention is made of sight restoration, of whose details we know but little. Most dramatic is that of Saul of Tarsus[7] who suddenly went blind on the road to Damascus, and whose sight was restored three days later by Ananias.

Among the remains of the kingly palaces in Nineveh and Babylon, basreliefs may be seen showing the blinding of prisoners with hot irons. This shockingly cruel practice was continued in other countries, often with horrible frequency, until about 1800 A.D.

In ancient Greece, the first-mentioned and most famous blind legendary character is Homer[8] (about 1000 B.C.) whose loss of sight is somewhat corroborated by numerous references to it in his works:

"Dispel this cloud, the light of heaven restore,
Give me to see, and Ajax asks no more".[9]

Philip of Macedon[10], father of Alexander the Great, lost an eye from an arrow wound received in the siege of Mentone about 353 B.C.

Would you have followed the example of Marcus Atilius Regulus[11], the Roman consul who, having been taken prisoner by the Carthaginians, was sent to Rome on parole for the purpose of negotiating the Carthaginian peace terms, but after urging their refusal in Rome, returned to Carthage, true to his oath. The Carthaginians cut off his eyelids and then exposed him to the scorching rays of the African sun.

Hannibal[12] (247-183 B.C.), general of generals, and the greatest enemy of ancient Rome, lost the sight of his right eye during the Second Punic War apparently from an inflammation of the cornea or uveal tract.

Turning from Carthage to Rome, once the hub of the universe, we are told that Horace[13], surnamed Cocles, having lost one eye in battle, stood off the Etruscans during the siege of Rome by Porsenna (507 B.C.). With two companions he held the bridge of Sublicius against the enemy until the Romans could destroy it, thus possibly saving the city. Jumping into the Tiber, he escaped, but was permanently crippled from a hip wound.

Cicero[14] (106-43 B.C.), Roman orator, politician, and writer, suffered over a period of years from a recurrent eye disease, lipitudo, the details of which are unknown.

The myopia of Nero[15] (37-68) and the concave emerald with which he viewed gladiatorial contests and the burning of Rome, are legends derived from a passage in Pliny, which is subject to numerous interpretations.

Few men have performed greater service than Belisarius[16] (503-565), the greatest general of the Eastern Roman Empire. It is said that his eyes were put out by an ungrateful Emperor, Justinian, whose kingdom he saved.

The cruelty which characterized the latter days of the Eastern Roman Em-

pire is again illustrated by the story of Constantine VI[17], whose eyes were burned out in his youth by his mother, Irene, to prevent his taking the throne.

Harold II[18], last of the Saxon kings of England, died from an arrow wound in the right eye, received during the Battle of Hastings, 1066.

King John IV[19] of Bohemia had his oculist thrown into the Oder River because the royal eye did not recover. Later John became totally blind and was killed at the Battle of Crecy, 1346.

Digressing somewhat, in a certain Florentine chapel, may be seen this epitaph: "Here lies Salvino d'Armati[20], a native of Florence, the inventor of spectacles. May God forgive him his sins. Died in the year of our Lord 1317."

The glasses worn by Leonardo da Vinci[21] (1415-1519), master mind, naturalist, anatomist, engineer, and painter, were minus two diopter spheres. His "La Giaconda," better known as the "Mona Lisa" now in the Louvre gallery, is probably the best known and most valuable painting in the world.

One of the most interesting places to study ophthalmology is an art gallery. The Chicago Art Museum contains a priceless collection of paintings by Il Greco[22], Domenico Theotocopuli. The relation of his distinctive human type to a possible astigmatism will be discussed in the next section in this series, "Eyes in Art".

The map of Europe was once possibly changed by the myopia of one man. The Thirty Years' War, one of Europe's gigantic religious conflicts, practically ended with the death of Gustavus Adolphus[23], king of the Swedes and military leader of the Protestants. His death during the Battle of Lutzen in 1532 was said to have been partly due to his nearsightedness. In the stress of battle, he became separated from his escort farther than caution would have dictated, and due to his myopia, was unable to see the approach of a small detachment of Germans who killed him.

Benvenuto Cellini[24] (1500-1571) wrote that a small splinter of steel from a chisel struck his right eye with such force that he thought the sight would be lost. After several days, his physician removed the steel by letting the blood from several live pigeons gush into the eye, which immediately felt better. Two days later the splinter came out. This gifted and versatile sculptor, goldsmith, troubadour, assassin, and writer, gave the world one of its most remarkable autobiographies which after three hundred years is still a classic.

In January, 1545, Martin Luther[25], the great German religious reformer and founder of Protestantism, wrote that he had but one seeing eye.

Galileo Galilei[26] (1564-1641), famous astronomer, who perfected the telescope and explained the variations of the moon, lost his sight in both eyes. It was he who first expounded the Copernican theory that the earth revolves about the sun. For this he was convicted of heresy by an inquisitional court and forced to abjure publicly his belief. You probably remember that as he was leaving the court, he whispered to a friend, "But it does move."

Retinal detachment, following myopia inherited from both of his parents, is believed by Sorsby to have caused the blindness of Milton[27] (1608-1674). Some of his greatest works, including "Paradise Lost" and "Paradise Regained," were dictated when sightless.

Dr. Samuel Pepys[28] (1632-1703), whose famous diary has been modernized and popularized by the witty editor of the Journal of American Medical Association, had a somewhat varied ophthalmic history. Besides his high refractive error and presbyopia, he apparently had a convergence deficiency, which he minimized by a small leather shield attached to the temporal side of his glasses.

While he was composing the oratorio "Jephtha" (1752), the sight of Handel[29], one of the world's greatest musicians, began to fail. He was unsuccessfully couched for cataract three times, and was totally bind during his last several years in which he composed some immortal musical classics.

Admiral Lord Nelson[30] (1758-1805) was blinded in one eye by an injury received in a naval battle near the Island of Corsica. It is said that on one occasion, to avoid an unwarranted retreat signaled by his superior officer Lord Hyde, Nelson placed the telescope be-

fore his blind eye and claimed that he could not see the signal. He continued the battle, substituting victory for a probable defeat.

Marshal Massena[31], the greatest of Napoleon's generals, lost the sight of one eye as the result of an accident. While pheasant hunting in the forest of Fontainebleau with Napoleon and several other generals, he was accidentally shot in the eye by Napoleon.

The world is indebted to the color blindness of John Dalton[32] (1766-1844) for its first great work on color vision. On this account color blindness is sometimes called Daltonism. He was one of England's greatest physicists and the father of the atomic theory. Dalton's amazing color combinations in dress were a source of great amusement to his friends.

Schiller[33] (1759-1805), the great German poet, was myopic, as was Beethoven[34] (1770-1827).

William Prescott[35] (1796-1859), the famous American historian, whose Conquest of Mexico and of Peru are so well known, was practically blind during the latter part of his life.

Portraits of Abraham Lincoln[36] (1809-1865) show his marked hyperphoria.

A blind man gave to the blind the first practical method of reading and writing. After years of patient effort, George Braille[37] (1809-1852) perfected his simple six-point method of perforated characters which in a slightly modified form is almost universally used.

Every ophthalmologist should read "Entre Aveugle" (On Becoming Blind) by Dr. Emile Javal[38] (1839-1903). He, one of France's most famous ophthalmologists, gave to the world, with Schiötz, the ophthalmometer in its present form. Dr. Javal lost his sight from chronic glaucoma. He described the problems and difficulties of approaching blindness in a most pathetic manner, the realism of which was enhanced by his knowledge of ophthalmology.

Guy de Maupassant[39] (1850-1893), probably the greatest French short-story writer, had diplopia due to paralysis of the extraocular muscles, symptom of the general paresis from which he died. The careful reader can detect in his remarkable stories the premonitory symptoms of a diseased mind.

Two of our recent great presidents had interesting ocular histories. Theodore Roosevelt[40] (1858-1919), who was very astigmatic, lost the sight of one eye from an injury received in a boxing contest at the White House, while President Woodrow Wilson[41], one of the most remarkable personalities of our time, was blind in his right eye from a retinal hemorrhage.

William Marconi[42], the famous inventor, to whom the world is largely indebted for the wireless telegraph and the radio, lost one eye following an automobile accident in 1911.

Between 1900 and 1906, Dr. George Gould[43], one of our foremost ophthalmologists, wrote several volumes which have had a far-reaching effect on American ophthalmology. He brought to the attention of the medical world, in a clear and forceful manner, the importance of eye strain and its effect on personality, mental fatigue, numerous functional diseases, and human accomplishment. He analyzed numerous historical characters illustrating the influence of eyestrain on their lives:

"The pessimistic or gloomy writers and artists were almost entirely great sufferers from eyestrain and from its result, migraine. There were, for instance, Nietzsche, the two Carlyles, de Maupassant, George Eliot, Wagner, Tschaikowsky, Chopin, Symonds, Tolstoi, Heine, Leopardi, Schopenhauer, Turner, Obermann, Thomson (the younger), Poe, and many more. Others that partially or wholly conquered the 'migraine' of eyestrain by opium, or by renouncing ocular near-work, by walking, etc., are Mrs. Browning, De Quincy, Coleridge, Beethoven, Parkman, Whittier, Margaret Fuller, Browning, Huxley, Spencer, Taine, Darwin, Lewes, Hugh Miller, Southey."

The blind and semi-blind frequently develop an exceptional visual memory, probably a substitute for sight. In this way one can often sense the blindness of an author in his writings.

One must marvel at the accomplishments of the blind and those who see poorly. They have given the world some

of its greatest treasures and often at a tremendous cost of effort. A few of the many distinguished blind personages of our time are: Fanny Crosby, Senators Gore and Schall, Blind Tom, Axel Munthe, and E. B. Frost. Their services to the world will be described in a supplementary contribution, as will the blindness of some who lost their sight in the World War.

These historic incidents have been selected because of their outstanding interest. They have been gathered from numerous and sometimes unusual sources which are believed to be reasonably accurate. They are presented in as nearly the original form as possible. As one turns back the pages of history however, the separation of fact and fancy is often difficult, and original sources of information are frequently subject to numerous interpretations.

Those who know of interesting incidents pertaining to the eyes of famous characters will render a service by reporting them, or by communicating with the writer. This subject, about which little has been written, especially in English, should be amplified. Ophthalmic literature is the logical place for such a record, not only from a cultural point of view, but also as a memorial to the accomplishment of the blind and those with poor sight.

Here concludes the first of our Little Journeys. If interest justifies, we shall soon take another in "Eyes in Art", and in time we shall visit ophthalmologically various cultural fields.

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NOTES, CASES, INSTRUMENTS

OCULAR INJURIES FROM AIR GUNS

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In a previous communication two cases of eye injuries by air guns were reported (Rodin, F. H., and McKee, A. B. Jour. Amer. Med. Assoc., 1928, July 14, v. 91, pp. 85-86).

The first case was that of a boy, aged 16 years, who had been struck in the right eye by a BB shot from an air gun. A roentgenogram showed the shot in the orbit. Fifteen days later the shot was seen partly projecting through the conjunctiva at the place where it apparently had entered. It was removed with a chalazion curet.

Case 2 was that of a boy, aged 11 years, who was first seen on January 3, 1928, with a history that he was behind a box while his playmate was shooting with an air gun at a target behind the box. As the shot was fired something struck his left eye, and since that time he had been unable to see well with that eye. The patient did not think that the shot had entered the eye.

A roentgenogram showed a BB shot, outside the eyeball and within the orbit. This boy was not seen again until March 31, 1931, three years and three months after the injury. He said that he had had no trouble with the eye until ten days previously when it had become red. He was seen at that time by an ophthalmologist who reported that the eye was badly inflamed, but that he saw no foreign body in the conjunctiva. When he was seen by us the eye was free from inflammation.

Roentgenograms were taken, but failed to show any foreign body in the orbit. They were compared with those taken after the injury in which the BB shot was distinctly seen.

The shot must have escaped from the orbit during the interval between the time he was last seen in Feb. 27, 1928, and the present visit, March 31, 1931, a period of three years and one month. The boy reported that he was not aware of any shot having left his eye during that period. It is possible that the shot might have left the eye when the eye had last become inflamed, that is three years and three months after the injury. This seems the most likely explanation as his eye had been free from any disturbance previous to that time.

Case 3. R. B., a boy, aged 11 years, was first seen on April 24, 1931, complaining that he had not been able to see well with his left eye for one month. There was no history of any injury to his eye.

A month previously he had been seen by a physician because of pain in the left eye and over the left orbit. His examination at that time showed the following: There was ecchymosis of the eyelids of the left eye; the conjunctiva was red; the globe pushed forward and slightly upward. The pupil was dilated and did not react to light. The ophthalmoscopic examination showed a hazy fundus with a few red blotches; the retinal vessels could not be made out clearly. Three days later there was a fluctuating mass in the outer lower part of the orbit. This was incised and about a tablespoonful of thick yellow pus was obtained. The tentative diagnosis made by the physician at that time was infected ethmoiditis which had filtered into the orbit.

Examination showed the following: The vision of the right eye was 20/20; left eye limited to distinguishing fingers at 14 feet. The right eye was normal. The left eye showed no external pathology. The fundus revealed the following: The disk was normal in shape and size. The pigment of the macular region was disturbed and appeared granular. The pigment between the disk and the macula was also somewhat disturbed.

Retinoscopy of each eye was +2.00 D. Sph., but the vision of the left eye could not be improved with a lens.

The blood Wassermann reaction was negative.

As nothing was found to explain the poor vision of the left eye he was re-

ferred to a rhinologist for further study, the report of whose examination was negative and who ordered a roentgen-ray study of the sinuses.

The roentgenogram showed (fig. 1) a shot in the right lower quadrant, outside the eyeball, lying well forward along the lateral wall of the orbit.

When the findings were given to the boy he was at loss to explain the injury to the eye, although he admitted that he had been using an air gun for a month previous to his loss of vision, and that he had been playing with boys who had air guns.

Fig. 1 (Rodin). Roentgenogram showing foreign body in the orbit (case 3).

The abscess of the orbit seen a month previously was probably caused by the entrance of the BB shot into the orbit.

The boy was not seen again until August 19, 1932, sixteen months after the first visit. According to him there had been a slight improvement in the vision of the injured eye.

The vision of the left eye was 20/200, and he was able to read the last letter in the 20/100 and 20/70 line. The fundus revealed no change from that seen on the first examination.

The visual fields showed (fig. 2) a constriction of the peripheral fields, the central field showing an absolute temporal paracentral scotoma, contracted

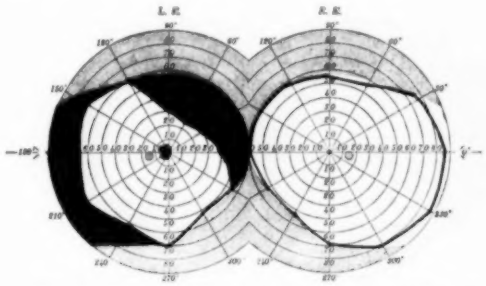

Fig. 2 (Rodin). Field of vision: constriction of the peripheral fields and an absolute temporal paracentral scotoma, contracted to within five degrees of the fixation point (case 3).

to within five degrees of the fixation point.

The roentgenogram taken at this time indicated no change in the position of the foreign body in the orbit.

Comment. It is interesting to note that in case 2, previously reported, and in the present case there was no history of any BB shot entering the orbit; in fact, in the present case the patient did not think it was important enough to state in his history that he had been using an air gun and that he might have been injured by a shot.

In case 1, previously reported, the BB shot left the orbit fifteen days after the injury. In case 2, the shot left the orbit sometime between the patient's last two visits; that is, from two months to three years and three months after the injury. It is possible that the shot left the orbit when the eye became red in the last attack, three years and three months after the injury. The only presumption for that is the fact that the eye had been free from any inflammation until that time.

In case 3 we have a patient presenting himself with poor vision in one eye without a history of any injury, and it was only by taking roentgenograms

that a shot was found in the orbit. Roentgenograms taken sixteen months later showed the shot still in the orbit, and in the same position.

The indiscriminate use of air guns by children should be discouraged.

490 Post street.

SUPERIOR RECTUS SHORTENING TO CORRECT CERTAIN HORIZONTAL DEVIATIONS

A report of four cases

RODERIC O'CONNOR, M.D.
SAN FRANCISCO

It seems worth while to report these four cases for the following reasons: 1. To show that rule-of-thumb methods, such as "shorten and cut for the major apparent deviation," are occasionally out of order. 2. To show again that vertical deviations are often the sole cause of horizontal deviations. 3. To emphasize the importance of looking for such deviations in all cases before operating, and especially before cutting an inferior oblique. 4. To prove the need to have some convictions on the subject. 5. To encourage others to acquire such convictions and to act upon them by operating on the muscle found to be at fault. Similar conditions are very frequent in heterophorias but it was thought best, for the sake of emphasis, to report only the squints.

Case 1. Mary M., aged 3 years plus, at date of first visit in October 1920. Examination: Convergent squint, O.S. fixing. Refraction under atropin was +1 D.sph. in each eye. Media and fundi were normal. The patient tilted her head toward the left shoulder. Monocular rotations were normal. Binocular rotations: very high upshoot of right eye when the left turns out, both level when right eye turns out.

Diagnosis: Paresis of left superior rectus with overaction of right inferior oblique. It should be noted that on looking down (away from the weak muscle), the eyes became perfectly parallel as shown by the pupillary reflections from a light; also that the patient fixed with the eye at fault.

Shortening of the left superior rectus was advised but the father, even though a medical man, could not be made to see the reason for operating on a vertical muscle of the straight eye.

She was seen again in December, 1921, and in September, 1922, by which time she was able to be tested with the Maddox rod. The results were right hyperphoria 15$^{\Delta}$, left cataphoria 25$^{\Delta}$. This time a cinch shortening of the left superior rectus was permitted and a perfect cosmetic result secured. She was shown at the 1923 meeting of the American Medical Association in San Francisco and was last seen in September 1932. With Maddox rod she then tested, in the primary position, esophoria 4$^{\Delta}$, left cataphoria 10$^{\Delta}$. Light reflections centered in all positions except left rotation when the right eye went higher. There were no headaches or other symptoms even after prolonged near use. There was third degree binocular vision. Vision was 20/20 plus, each eye without any correction, none ever having been used.

Theoretically there was enough remaining vertical deviation to call for correction but it was not advised because of the entire absence of any symptoms subjective or objective.

This case shows that good results can be secured by shortening the muscle at fault instead of cutting the opposite inferior oblique. Possibly even better results might have been obtained had the operation been done two years sooner.

Case 2. Miss C. L., aged 25 years, was seen first in September, 1924. Refraction was unimportant, vision being 20/20 plus, each eye with low compound hyperopic correction. The patient complained of losing her place in reading because of vertical diplopia. Muscle tests: right cataphoria 4$^{\Delta}$, left hyperphoria 20$^{\Delta}$, which decreased markedly on looking down; right and left exophoria 22$^{\Delta}$.

The diagnosis being paresis of the right superior rectus this muscle was shortened by my cinch method on October 4, 1924. The tendon was very frail, being only about one half the normal width and it was displaced inward so far that its outer margin was directly above the center of the pupil. The immediate

over-effect was 3$^{\Delta}$ which on the fourth postoperative day had increased to 15$^{\Delta}$ so the patch was removed and vertical rotations ordered. On October 24 she tested 3$^{\Delta}$ over-effect and the exophoria had been reduced to 4$^{\Delta}$. On November 7 the tests were O.D. cataphoria 1$^{\Delta}$, exophoria 5$^{\Delta}$, and she fused the red and white images in the red-glass test. On January 28, 1925, she tested orthophoria in both directions with no deviation behind cover.

This makes a good companion case for the first, being just the opposite condition relieved by the same operation.

Case 3. R. W. D., aged 30 years, was seen in July, 1927. Preoperative tests showed left hyperphoria 10$^{\Delta}$, right cataphoria 8$^{\Delta}$, lessening rapidly on looking down, esophoria 20$^{\Delta}$. On July 29, 1927, a cinch shortening of the right superior rectus gave an immediate over-effect of 6$^{\Delta}$. Healing was uneventful. One year later he tested esophoria 1$^{\Delta}$, vertical orthophoria, and was entirely free from symptoms. This patient used lenses of +4. D.sph. and +5. D.sph. on the right and left eyes respectively, but all tests were made while wearing them. It is, of course, possible that correction of the vertical deviation permitted the glasses to act to relieve the esophoria.

Case 4. Yvonne P., aged 4 years when first seen in July, 1927, showed a right eye which had visibly converged practically since birth. She was a patient of another oculist who asked me to operate, lens correction having failed to relieve the strabismus. Binocular rotations showed a high upshoot of the right eye when the left rotated out, and out and up, while in looking to the right both eyes remained level. On looking down the eyes became perfectly parallel as shown by pupillary light reflections.

Operation on August 4, 1927, was a cinch shortening of the left superior rectus. On September 12, 1927, the eyes were parallel for near as well as for distance fixation, as shown by the reflection test.

In July, 1928, the right eye converged at times but with red-glass tests there was only 8$^{\Delta}$ esophoria, the vertical tests being uncertain. The mother was not satisfied with the result and so, to please her, the right externus was cinch shortened on August 6, 1929. The internus was not touched. On January 6, 1930, the eyes were level and parallel convergence was maintained up to four inches. In spite of this the mother was not satisfied because the child had to wear glasses, +2 D. sph. $\bigcirc\!\!\!\!\sim$ +1.50 D. cyl. in each eye.

450 Sutter street.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

CHICAGO OPHTHALMOLOGICAL SOCIETY

October 24, 1932

Dr. Michael Goldenburg, president

Intraocular tumor

Dr. Jesse H. Roth presented a man twenty-one years of age, who gave a history of failing vision for the past two years in the left eye which was now blind. About three weeks ago it became painful and injected. Examination showed a hazy cornea and the pupil widely dilated. A tumor mass was visible to the temporal side of the fundus, the aqueous cloudy with yellowish exudate, the iris atrophic; tension 59 mm. General examination and laboratory studies were negative.

Blepharochalasis

Dr. Sanford Gifford said that this boy, now twelve years of age, had had attacks of swelling of both eyelids since the age of five. During the attacks which lasted about a week, there was a swelling of one side of the nose at the same time. General examination was negative. Although at first there was a four plus Kahn reaction, the Wassermann was negative, and later both were negative. During the past three weeks one lid had been swollen, associated with swelling inside the nose. Ephedrin treatment of the nose caused the swelling to subside. An atrophic wrinkled condition of the skin was definite. He said that the skin sometimes hung down over the lid, requiring excision. The condition was apparently the result of an angioneurotic edema, with a tendency of the skin to absorb. The rhinologists who had seen the case believed that the congestion present during the attacks was allergic.

Retinitis pigmentosa

Dr. George Guibor said that this man, forty-six years of age, complained of failing vision. Vision O.D. was 20/70; O.S. 20/40. Examination showed posterior synechiae in the right eye, and many pigmented spots on the anterior lens surface. In the left eye many bone-corpuscle-shaped areas of pigment were seen over the veins. Dark adaptation was greatly below normal. Fields were characteristic, discs showed secondary pallor and the vessels were small and threadlike. In the better eye a few bone-corpuscle-shaped pigment spots were seen. Since 1859 fourteen cases of monocular retinitis pigmentosa had been reported.

Trachoma in wrestlers

Dr. O. B. Nugent presented a twenty-three-year-old man, a professional wrestler. Eight cases of trachoma in wrestlers were reported in the American Journal of Ophthalmology by Patton of Omaha, who stated that the patients usually came with an acute inflammatory conjunctivitis which appeared about ten days after a wrestling match.

Maldevelopment of an orbit

Dr. Elmer A. Vorisek (for the Goldenburg service at the Illinois Eye and Ear Infirmary) presented a man twenty-two years of age, with a small, disfiguring left orbit. The eye had been enucleated at the age of two years. The right eye was entirely normal.

There was ptosis of the left upper lid and slight ectropion of the left lower lid. The conjunctival sac was small; the palpebral fissure measured 21 by 8 mm. An external canthoplasty was performed, and two weeks later plastic surgery had been done to enlarge the left upper fornix. The case was presented to demonstrate the maldevelopment of a bony orbit from which the eyeball was removed in infancy, and to show the problems involved in its treatment.

Encephalitis lethargica with muscle paresis

Dr. Vorisek also showed a woman forty-nine years of age, with a history of attacks of nausea and vomiting, fol-

lowing one of which a ptosis of the right upper lid was noted.

Examination showed complete ptosis of the right upper lid; pupils dilated to 7 mm. and fixed. The right eye diverged 45 degrees. Vision O.D. was fingers eccentrically. The right disc was slightly elevated; there was slight movement by the right external rectus. The left disc was normal. The external rectus could abduct and the internal rectus adduct to the midline.

General physical examination was negative as well as laboratory studies including the blood and spinal fluid. Neurological examination showed involvement of the twelfth nerve on the right.

Solar scotoma

Dr. Vorisek said that the patient, a boy, aged fifteen years, when seen September 3, 1932, complained of photophobia, blurring, and loss of vision since having watched the eclipse without smoked glasses. The left eye had been enucleated in infancy following injury.

Examination showed slight redness of the nerve head; visual acuity of 20/200. Physical and laboratory examinations were negative. A week later the vision had improved to 20/40 with a +1.25 D.sph. Photophobia continued until September 20. On October 18, the patient stated that the blind spots had disappeared, but examination showed central scotoma still present. With Peter's campimeter a central scotoma for form and color of about three degrees was noted, with 1 mm. target. Form field was concentrically contracted to 20 degrees; red field 9 degrees; blue field, 8 degrees; blind spot was normal. Perimetric examination also showed a concentric contraction of form and color fields, with blue slightly larger than red.

Thrombosis of right superior temporal retinal artery

Dr. J. E. Lebensohn said that a year ago this patient noted recurrent attacks of fogginess in the right eye, and finally visual loss became permanent. Vision O.D. was fingers; O.S. 20/25. Systemic diagnosis was chronic myocarditis. Blood Wassermann was negative. The superior temporal artery had been converted into a filiform white cord, the arterioles of the collateral circulation were markedly varicose, and some veins were still incompletely filled.

Radiational cataract

Dr. Lebensohn said that this man's cataracts were due to exposure to heat in the iron industry, in which he was engaged for many years. The right cataract had been extracted and vision was 20/25 with correction. There were two types of cataract in the left lens, as in the right, a posterior cortical cataract due to heat and a peripheral puberty coronary cataract which had become accentuated with age. An important fact about radiational cataract was the good visual prognosis after operation.

Monolateral trachoma

Dr. Lebensohn said the right eye of this patient was absolutely healthy and had never caused any trouble. The left eye had a scarred, hypertrophied tarsus, pannus, and a history of recurrent ulceration. No local immunity developed in trachoma, and it was strange that the other eye had not become involved.

Eclipse amblyopia

Dr. Lebensohn showed a young man who had lost his right eye in an accident when eight years of age. When examined on September 5, a week after the eclipse, which he had examined with ordinary sun-glasses, there was noted a positive absolute central scotoma of three degrees, and a relative scotoma of ten degrees around that. Vision was now improved, though he still saw the spot before him. The ultimate prognosis was usually favorable.

Hole in the macula

Dr. Lebensohn presented a sixty-five-year-old woman, who had a history of lues at the age of eighteen years. Tags of organized exudate adherent to the upper margin of the iris, gave evidence of a chronic iritis. The vitreous

was filled with fine opacities. The retinal arteries showed a high degree of arteriosclerosis, and in the region of the macula was an almost round hole, about half the size of the disc, deep red in color. This macular hole was evidently due to toxic and senile changes.

Robert von der Heydt

ROYAL SOCIETY OF MEDICINE, LONDON

Section on Ophthalmology

November 11, 1932

Mr. A. C. Hudson, president

Pemphigus

Mr. J. Attlee presented this case in order to receive suggestions as to treatment. One of the best treatments was said to be tartar emetic, intravenously injected. The man had received mild doses of radium, since when the right eye had improved.

Discussion. Mr. J. H. Fisher referred to a patient who had pemphigus of the conjunctiva, with shrinking of the conjunctival sacs, and considerable vascularity of one of the corneae. She developed bullae on the skin and on the mucous membrane of nose and mouth. He gave a bad prognosis. A year later she returned with the condition much better, and reported having caught measles sometime before the second visit, and the improvement synchronised with the attack of measles. As the latter was not a grave disease it seemed justifiable to give it to a subject with such a serious and stubborn disease as pemphigus.

Mr. Mayou spoke of a boy who had pemphigus, with the typical essential shrinking of the conjunctiva. That was ten years ago. Local treatment with paraffin saved him from corneal involvement, and when he saw the boy the corneae were still clear. Many of the cases of so-called pemphigus were, he felt, wrongly diagnosed.

Mr. A. C. Hudson said he had used convalescent measles serum in a case of pemphigus under his care, but it did not influence the disease.

Multiple congenital ocular abnormalities

Dr. A. J. Ballantyne said the possessor of this museum of shortcomings was a female infant only six days old. There were edema of eyelids, a small notch at the junction of the middle and nasal thirds of the upper eyelid, a dermoid 3 mm. in diameter on the limbus in the "4 o'clock" position, another dermoid between "6 and 7 o'clock", a subconjunctival lipoma in the lower and outer part of the eyeball, also xerosis of the conjunctiva. There was a coloboma of the iris up and out, while three bands of tendinous tissue stretched across the anterior chamber from angle to angle. In the other eye he found an anterior polar cataract, and a dimple at the naso-labial fold. In both parents the Wassermann was negative. The child was a first-born; there was no illness in the parents and no consanguinity. The birth was easy, without the use of instruments.

Discussion. Mr. Mayou thought that the dermoids in the cornea associated with gaps in the eyelid could be explained by imperfect closure of the eyelid during fetal life. He had shown, years ago, that in animals in which the conjunctival sac was divided into two, as in snakes, the conjunctival sac, where it was closed, always remained lined with a single layer of epithelium. In fetal life in the human, during the time the eyelids were closed, the conjunctiva remained as a single layer of epithelium until the eyelids became separated. That was the case also in cats.

Miss Ida Mann said she had recently seen three eyes with bands stretched across the anterior chamber, largely adherent to the back of the cornea; there was also a persistent pupillary membrane at a deep level.

Miliary tubercle of choroid

Mr. G. Penman and Mr. Eugene Wolff presented the case of a female child, aged eight months, who had been ailing since she had diphtheria three months previously. There was a cough, an impaired percussion note at the left base, and bronchial breathing. The

Mantoux test was positive: the spleen became palpable and the wasting was obvious, the temperature rising. Tubercle bacilli were recovered from sputum and stools. The right fundus was normal in all respects, but in the left fundus, below the disc, was a yellowish ill-defined, rounded and slightly raised area, about half to two-thirds the size of the disc. This was reported as choroidal tubercle. Mr. Wolff's post-mortem report commented on the swelling of the choroid in the vicinity of the lesion. There was an infiltration with round and epithelioid cells, and caseating areas which stained pink with eosin, especially the vessels. Tubercle bacilli were present in great masses.

Modified Toti's operation for lacrymal obstruction

Mr. Edward D. D. Davis said that though he was pleased with the results of the modified Toti in a number of the cases, his figures showed that about twenty-five percent of the operations performed had failed, i.e., the symptoms had not been relieved, but the condition was not definitely worse as a result of the operation. His own knowledge of lacrymal disease was limited to cases sent to him by ophthalmic surgeons for examination of the nose, or for West's operation of intranasal dacryocystotomy.

The two conditions most liable to be followed by inflammation of the lacrymal sac were lupus, and atrophic rhinitis. The sac could be inflated by a forcible blowing of the nose while pinching the nostrils. It was also possible to pass a fine eustachian catheter into the orifice, but the folds of mucosa in the duct prevented free inflation.

The modified Toti operation was known to rhinologists, he said, as Mosher's operation, as it was more recently described and advocated by Professor Harris Mosher of Boston, U.S.A. Mr. Davis described the operation, and said that the external operation was mechanically easier and more accurate than the West or Polyak intranasal dacryocystotomy. The intranasal operation in a narrow nose with a deeply concave atrium of the middle meatus, or in the small noses of children, could not be satisfactorily performed. He had now completely abandoned the intranasal operation. Some of his intranasal operations which failed had been submitted to the external operation with success. His records of 24 cases in which Toti's operation was done showed six failures, the sac was still suppurating and epiphora was present. Given a careful selection of the cases for the operation he believed that the number of failures would be considerably reduced. All the operations he had referred to were done more than six months ago. J. S. Fraser's (of Edinburgh) large series of cases showed a similar percentage of failures. The most successful cases were those with a dilated sac, with or without suppuration.

Discussion. Mr. G. H. Howells spoke of the operations he had been doing for the condition at Moorfields Ophthalmic Hospital. He observed much the same procedure as Mr. Davis, except that he, the speaker, removed more bone. Intranasally the anterior third of the turbinate was removed, and in several of his cases he found it necessary to remove the anterior ethmoidal cell over the area. He removed the whole of the nasal wall of the sac down to its neck. The sac was then allowed to fall in over the nasal opening without any attempt at suturing, except that the skin incision was closed by one suture. After the operation the sac was irrigated on alternate days for the first fortnight, and later at increasing intervals. He had done the operation on only nine cases, and the results had been satisfactory. As, however, they had been done only a year it was too early to speak very definitely as to ultimate results.

Mr. Mayou said he had not found lipiodol of practical use in investigating these cases.

Mr. Affleck Greeves asked as to the reason for removing the anterior part of the turbinate. Mr. Traquair, of Edinburgh, achieved good results without interfering with the turbinates.

Mr. Harrison Butler considered that a greater proportion of these cases were

due to ethmoiditis than Mr. Davis seemed to think. He also referred to the condition known as diverticulum of the sac.

Mr. Davies (Cardiff) said he had been doing the external operation, which was first described by Higgens, for twenty years. But he had never interfered with the contents of the nostril, though in some of his cases he had thought that removal of the anterior turbinate might have been an advantage. He removed the whole of the lacrymal fossa. He had done the operation in about 300 cases, and about 70 percent of them were successes. The failures were evident at about the fourth or fifth month after the operation. The cause of the failure, nearly always, was a cicatrising of the tissues. He did not remember having had a case of trouble in the nose.

Mr. Davis, in reply, said the size of the turbinate varied much in different patients. He removed it because he was afraid of adhesions between the middle turbinate and the opening of the sac. In one or two cases in which there was plenty of room he had left the turbinate in position, but he afterwards regretted having done so. In the Nose department of his hospital there were many cases of ethmoidal suppuration, but very rarely accompanied by lacrymal sac complications.

(Reported by H. Dickinson)

ROYAL SOCIETY OF MEDICINE, LONDON

Section on Ophthalmology

December 9, 1932

Mr. A. C. Hudson, president

Chronic glaucoma treated by cyclodialysis

Sir Richard Cruise exhibited patients upon one of whom he had operated eight years ago. They now showed satisfactory filtration areas in the region of the incision. He said that the essential part of the operation was the use of the original Herbert incision, which he made slightly larger than was the custom. It was also important to use massage, continuing this for a week to ten days. The performance of cyclodialysis was urged upon him by Dr. H. H. Sinclair, of Edinburgh, and these cases showed how satisfactory a result was obtainable in glaucoma.

Discussion. Mr. A. C. Hudson asked whether Sir Richard had had any cases in which sclerotomy had not succeeded. At one time cyclodialysis was extensively practised at Moorfields, but it was then given up, the chief reason being that the results were not always dependable.

Sir Richard Cruise replied that he did not think unvarying success could be claimed for this operation. In some cases he had performed the operation twice. He definitely kept trephining as a last resort.

Retinal detachment

Mr. Montague Hine exhibited a twenty year old boy with a retinal detachment in the right eye; the left eye was amblyopic. The detachment extended nearly completely round, and the field of vision was much constricted. He had a small horseshoe-shaped tear on the outer side. A Gonin operation was carried out, using the electrocautery. Vision was now 6/9, and the condition had remained well 21 months.

(Reported by H. Dickinson)

LOS ANGELES SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

November 28, 1932

Dr. Dean Godwin, acting president

What price theory

Dr. Carl Fisher called attention to the prevalence of false conceptions both in ancient and modern times. In ancient China, medicine made little progress because of religious beliefs, and penalties imposed for originality. Theories were formulated without any investigative background. Amputated parts were retained by the patient for reassembly in the next world. The ancient Chinese materia medica consisted of fifty volumes. Too much respect for authority

hampered their medical progress just as it hampered the progress of many individuals today.

Quotations were read from a widely circulated present day popular book upon the eye, in which the writer stated that accommodation was performed by the oblique muscles. The fact that these statements were generally accepted by readers proved that the medical knowledge of the average man of today might have as little basis as that of the ancients.

The Hindus, one thousand years before Christ, described a cataract operation and advised remaining in a dark room with bandaged eyes for ten days following the operation. Dr. Fisher felt that their medicinal remedy for cataract, hyena bile, was as good as any we had today.

The suction operation for cataract was used by the Arabs. An Arabian book on ophthalmology was written nine hundred years ago. Our faith in antiseptics today in the face of scientific proof of their lack of efficaciousness might be likened to the blind faith of the ancients in their peculiar remedies.

The vitality of ideas which had no basis of fact was astounding. Present day prescribing of polyglandular extracts was only one of our fallacies. Just because we had been doing certain things for many years was no reason for continuing to do them. As Verhoeff once said, "There is no use going on for twenty years making the same blunders."

Discussion. Dr. W. M. Gardner stated that he had a letter saying that the proponent of the theory of accommodation by the oblique muscles, mentioned by Dr. Fisher, suffered from amnesia for two years. Unfortunately, however, his teachings were accepted by the public and by some of the profession.

Etiology of trachoma

Dr. Harvey Howard, by invitation, presented this paper which appeared in this Journal, v. 16, no. 2, p. 132.

Discussion. Dr. A. C. Macleish stated that formerly pannus tenuis was regarded as a result of irritation by the lids, and pannus crassus as a true trachomatous pannus.

Dr. A. Ray Irvine said that ten years ago he was called to the Imperial Valley with the statement that fifty to eighty percent of the children there were afflicted with trachoma. He examined five thousand school children in three months. One hundred and fifty had been operated on before he arrived. The follicular disease present had been noted for over seven years by practitioners in the valley. The condition was confined to children of the lower grades in school. The mucous membrane between the follicles was elastic and transparent and no pannus was found. Dr. Irvine had always thought that over thirty percent of trachoma patients showed pannus, but was glad to learn from Dr. Howard that all cases developed it. These children were shown to be afflicted only with folliculosis, as were many others in the San Fernando Valley who were operated on every year. Exposure to alkali dust developed folliculosis in children of the adenoid type.

Dr. Semenov inquired if eosinophilia were present in the allergic lesions produced. Follicles were found in the nasal mucous membrane of cases of allergic sinusitis only, and were identical with those described by Dr. Howard as being found in trachoma.

Dr. Trainor wished to know if geographical location had any relation to the incidence of trachoma. Of three thousand children seen at the Children's Hospital only twenty-five had trachoma. In his private practice in North Dakota much more trachoma was seen by him than here in Los Angeles at the clinics.

Dr. Eugene Lewis remarked that he regarded trachoma as no single entity. The word infection used in connection with trachoma was misleading. Trachoma must be considered from a phylogenetic standpoint. It was a malignant folliculosis. There was no proof of the etiological significance of trachoma-bodies. In many of these cases there must be some trigger mechanism which only needed to be tripped.

Dr. Howard stated, in closing, that

as yet no histological examination of the experimental allergic tissue had been made so no knowledge as to the presence or absence of the eosinophilia was available. He had an experience similar to that of Dr. Irvine. Of two hundred children examined by him in the Coachella Valley only one could be doubtfully classed as trachomatous. The others had folliculosis.

M. F. Weymann,
Recorder.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

October 14, 1932

Dr. H. J. Rothschild presiding

Aneurysm of the orbit

Dr. W. W. Lewis (St. Paul) presented a patient who came into the office with an initial complaint of diplopia. At that time there was no evident cause for the diplopia. After a few weeks it was evident that proptosis was developing on one side. This condition gradually advanced for about ten months. Recently he came in with a very evident varicosity protruding through the lid. At that time a definite bruit could be detected and one could palpate the velvety rub of the pulse. Whether this was an ophthalmic vein or whether it had some communication with the arterial or venous circle at the base of the brain, could not be determined definitely. He rather doubted being able to get into the orbit to perform a ligation, and said he would like to hear what some of the members would advise in the handling of this case.

Discussion. Dr. V. J. Schwartz (Minneapolis) said that unless proptosis happened to be due to an exostosis, which was easily made out, it was difficult to find a cause. Referring to Dr. Lewis' case, Dr. Schwartz felt that carotid ligation was the only thing to do, as the patient doubtless had a rupture of the carotid artery into the cavernous sinus.

Dr. Schwartz suggested the following simple classification to keep the various causes in mind; unilateral proptosis might be due to any one of six general conditions which would cover most of the more frequent causes. The first was involvement of the bony orbit, such as exostosis, sarcoma, and all related pathology. Second, involvement of the periosteum, such as luetic or tuberculous inflammation. Third, involvement of the orbital contents, which, of course, might include a variety of entities, such as optic nerve tumors, orbital abscess, retrobulbar hemorrhage. Fourth, cavernous sinus thrombosis which had very characteristic symptoms. Fifth, the type of case which Dr. Lewis had shown, a pulsating arterial aneurysm. Sixth, proptosis secondary to disease of the sinuses.

The treatment of many of these cases was occasionally difficult because it might be hard to ascertain the exact cause of the trouble in a particular instance. Dr. Schwartz mentioned a case of his own, in which the history was such that it pointed definitely to an antecedent hemorrhage. The patient while in a department store about a week prior to the time he had seen her was struck on the head by an elevator door. On the eighth day following this the eye suddenly pushed out within three or four hours. Her serology was absolutely normal and she had nothing to account for this proptosis except a retrobulbar hemorrhage. This conviction was further strengthened by the fact that the eye subsequently regained its normal position without any treatment.

Dr. H. V. Hanson (Ft. Snelling) asked Dr. Lewis if he could hear a bruit over the eye. He had seen three similar cases.

Exopthalmos should be considered a symptom and not a disease. There were several diagnostic points of interest in differentiating between aneurysm of the ophthalmic artery, aneurysm of the internal carotid artery with pressure obstructing venous return, arteriovenous aneurysm between the internal carotid and cavernous sinus, angiomatous growths from the ophthalmic artery, orbital sarcoma, and orbital encephalocele.

If, with a stethoscope over the eye, a

bruit was heard synchronous with the pulse and the mass seemed to contain a moving blood column or was pressing on a vessel, then if the carotid was compressed and the bruit stopped the condition was associated with the carotid or its branches.

Second, a comparison was made by placing a stethoscope over the closed eyes alternately, listening to the respiratory signs as well as phonations, the naris on the side opposite that being tested being held closed. The nasal respiratory sound and vocal fremitus were intensified over the protruding eye when the lesion causing the exophthalmos was firm and solid; and the nasal respiratory sounds were diminished over the protruding eye when the lesion causing the exophthalmos was soft and contained fluid.

In the event that Dr. Lewis' case was an arteriovenous aneurysm between the internal carotid and cavernous sinus, it was a very serious affair. The only hope of relief was ligation of the carotid, either common or internal. Dr. Hanson said he preferred the internal but added that if one ligated without preparing the patient, death from hemiplegia would follow. The preparation of the patient consisted of compression of the carotid many times a day to the point of tolerance, such as tingling in the feet or hands, or dizziness. After this was carried on for six or eight weeks the internal carotid could be ligated with a fair degree of safety.

W. C. Camp,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY

October 15, 1932

Dr. E. M. Marbourg presiding

Corneal scars; vitreous floaters

Dr. E. R. Neeper presented Mrs. S., aged sixty-three years. She had had chicken-pox at the age of three at which time she was blind for six months. At the age of fourteen the left eye was nearly blind but lately seemed to be improving while the right vision was gradually diminishing. The left eye had always diverged at times and during the past fifteen or more years had been occasionally painful. The general health was excellent.

She came to Dr. Neeper because of lessening vision of the right eye, because of a feeling of weakness and uneasiness, and because of frequent pain in the left eye. The right eye showed no gross changes. The left cornea had nebulous scars in the anterior central area, probably from chicken-pox ulceration. The left lens had a frosted coral-like opacity, of distinctly golden color, which was most dense in the superior temporal quadrant. The vitreous had floating opacities which also were golden frosted. The fundus was too poorly seen to be studied. The vision of the right eye with —0.37 D. sph. ⊂ —0.37 cyl. ax. 45° was 20/20 plus. Vision with the left eye was fingers at one foot.

The case was presented because of the unusal golden tinted opacities, and for advice as to treatment of the left eye.

Discussion. Dr. Wm. C. Finnoff said that some eyes with considerable myopia would give pain even when one could find no active pathology present.

Groenouw's degeneration of the cornea

Dr. G. H. Stine presented Mrs. A., a fifty-one-year-old woman who had been first seen on March 17, 1932, her complaints being severe frontal and temporal headache, nausea, and vertigo. She said her mother had had cataracts (?). A twenty-one year old daughter showed nodular degeneration of the cornea of both eyes, with 0.4 uncorrected vision of each eye. Corrected vision of the right eye was 0.9; of the left eye 0.6—. The tension of each eye was found to be within normal limits. Each eye showed central nodular degeneration of the cornea. Most of the opacities were roughly circular with relatively clear centers, others were spicular and shaped like some crystals. Incipient lens changes were present in each eye. The right fundus was normal. In the left eye there were many dust-like opacities in the vitreous. There was a deep excavation of the disc, resem-

bling a glaucomatous cup. In the upper nasal quadrant near the disc was a massive atrophic, choroiditic area, with dense pigment on the margin.

The correction of the refractive error had relieved the symptoms considerably. The patient was going through the menopause, but physical examination was essentially negative.

Cataract; siderosis (?)

Dr. G. H. Stine presented Mrs. M., aged forty-five years, who, in a scuffle about ten years previously, had been struck in the right eye; since then she had been able to see only light with that eye. There was, however, no discomfort until January, 1931, when she reported to Dr. Stine with the history of headache and discomfort in the eye for three weeks. On examination the vision O.D. corrected was hand movements; O.S. was 0.8. Tension and other findings were normal except for golden nuclear cataract and some tenderness. The left eye was normal except for incipient cataract and slightly disorganized vitreous.

On October 12, 1932, the patient returned with the history that on September 12, the right eye was swollen and tender for about three days; there had also been headache. On examination the eye was negative except for a brownish yellow patch apparently in the stroma of the iris at the margin. There was no evidence of siderosis of the lens. In the left eye there were also a few very minute similar spots. X-ray of the right orbit was negative for a foreign body. There was no history of a foreign body striking the right eye.

Dr. Stine wondered whether the irritability of the eye could be due to siderosis or to the cataractous lens.

Discussion. Dr. Wm. H. Crisp said that in suspicious cases he would rely more on the sideroscope than the x-ray.

Dr. E. R. Neeper said he was somewhat distrustful of the x-ray after having in one case been given a negative report, when a foreign body was later found, and after having another case in which the report was positive and yet by dissection after enucleation no foreign body could be found.

Giant cell tumor (?) (conjunctival and episcleral); tuberculoma (?)

Dr. G. H. Stine presented Miss E., aged thirty-five years, who had been first seen on June 22, 1932, with the history that for about six months the extreme temporal portions of the right globe had been very red; there was only slight discomfort. About seven years previously she had been struck in the right eye with a tennis ball, causing a subconjunctival hemorrhage. On examination one could see a large, relatively flat, somewhat elevated, dirty-yellow mass occupying the entire upper temporal quadrant of the globe. The mass was somewhat sharply delimited in its lower margin by a tortuous dilated episcleral vein, the branches of which extended upward and over the mass, which was itself slightly injected. The mass sloped off moderately abruptly about 2 mm. from the upper temporal limbus. It was very firm and the conjunctica was completely adherent, except in the extreme upper portion; here the conjunctiva was slightly movable, and the mass was somewhat softer. There was no tenderness. The cornea, iris, tension, media, and fundus were all normal.

The mass was removed on July 15, 1932. A fairly definite line of cleavage between it and sclera was found. The denuded areas were covered by conjunctival flaps. For a while following the operation there was considerable ptosis and some diplopia. At the time of presentation there was no evidence of recurrence. The pathological diagnosis was giant cell tumor.

Discussion. Dr. Wm. C. Finnoff, who had seen the case in consultation before operation, said the sections were not typical of giant cell tumor. The peculiar round cell infiltration and the presence of giant cells of the Langhan's type made Dr. Finnoff believe that the mass might be tuberculous.

Old uveitis, macular degeneration (?); chiasmal arachnoiditis (?)

Dr. R. W. Danielson presented Mr. O. W. C., a thirty-two-year-old insurance salesman, who had been first seen a week previously, the history being

that he had lost some vision in the right eye two years previously following a cold. Two weeks ago he had noticed that the vision of the right eye was even worse, and that the left eye was also affected. There had been no pain or redness in the eye at any time.

On examination one found both eyes quiet. The vitreous in each eye contained many fine floaters; the right also containing a large, long floater. The disc edges seemed slightly indistinct, but there was no cupping, elevation, atrophy, or hyperemia. The vessels were somewhat contracted and there was one small area of old chorioretinitis, up and nasally, from the disc in the right eye. Each macula appeared somewhat degenerated. The vision O.D. was handmovements, and O.S. was 4/15 with —0.50 D. sph. The pupils reacted well to light and accommodation.

The field of the right eye showed a marked defect, up and to the left, both quantitatively and with colors; this upper left defect was also present in a less striking degree in the field of the left eye. Roentgenograms showed slight density of the antra and ethmoids of each side. The frontal and sphenoidal sinuses were clear. There was a bony closure of the anterior and posterior clinoid processes. The spinal fluid was under normal pressure, cell count 2.5, and Wassermann and colloidal gold were negative. The spinal fluid protein, however, was 62 mg. per 100 cc. (30 was normal). Dr. J. R. Jaeger had suggested arachnoiditis at the optic chiasm, as a diagnosis, but believed the ethmoids and sphenoids should be further investigated.

The case was presented because of the indefinite diagnosis and the question as to whether the abnormalities of the eyes themselves were enough to account for the degree of loss of vision.

Discussion. Dr. W. C. Finnoff thought the abnormal vitreous and fundi might possibly account for the lowered vision, but not the field changes.

Dr. G. H. Stine mentioned that the urinary proteose might be used in treatment if no other cause was found.

Dr. D. H. O'Rourke said that in view of the history of several miscarriages by the patient's wife, he would certainly consider syphilis. It was his custom in serious cases to send the spinal fluid to two different laboratories. He had seen one case of uveitis apparently very satisfactorily treated with urinary proteose.

Pterygium with imbedded cilia

Dr. E. R. Neeper reported the case of Mrs. S., aged sixty-seven years. One cilium in its entirety lay beneath the body of the pterygium from its apex downward, largely in a line from "1 o'clock to 7 o'clock." The other two cilia were transverse, the temporal one-half of each being free and lying on the bare cornea, while the nasal half of each punctured and extended into the body of the pterygium.

R. W. Danielson,
Secretary.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

January 10, 1933

Dr. J. B. Stanford presiding

Primary optic atrophy

Dr. A. C. Lewis reported on B. B. McK., aged twenty-four years, who when one and one-half years old was given doses of quinine for "congestive chills." Complete blindness immediately appeared and remained for nearly four months. He was finally able to read fine print and to graduate from High School, but the fields had remained contracted and acuity of vision reduced.

In February, 1931, he had an attack of "flu" with only slight evidence of nasal or sinus infection and no cough but he suffered general soreness and tenderness and could not be moved in bed without great pain. Vision became very poor but later improved somewhat.

On October 1, 1932, the pupils reacted slightly to light and accommodation and tension was normal. The vision in the right eye was finger counting at ten feet; the field was contracted to a six inch circle at a distance of one foot. The left eye had light perception.

The optic discs were atrophic, the retinal vessels threadlike.

The general medical and neurological examinations were negative. Extensive laboratory and x-ray studies were also negative except for cloudiness of the nasal sinuses and soreness of the eyeballs upon movement. The tonsils were hypertrophic.

Because of the seriousness of the case from the visual standpoint it was felt advisable to perform an operation on the sinuses and remove the tonsils. This was done in two stages. Sufficient time for improvement had not elapsed.

Discussion. Dr. J. B. Stanford obtained some additional history from the patient. He thought the patient had an idiosyncracy for quinine. It was his opinion that most operations on the sinuses advised for optic nerve lesions were unnecessary and unsuccessful.

Dr. A. C. Lewis stated that nothing definite in the sinuses had been found; the boy was desperate and wanted something done. The operation could do no harm and might do some good. His vision as a child was never as good as other children and quinine idiosyncracy was the probable cause.

Total ophthalmoplegia

Dr. John Nicholson (by invitation) presented the case of Mrs. J. B., thirty-five years old, married and colored. She had had two children and no miscarriages. The patient stated that two weeks before the onset of her eye symptoms, she developed pain and throbbing in her left ear. This was relieved when the ear started to discharge. At about this time she noticed pain around and above her left eye associated with frontal headaches and dizziness. She gave no history of diplopia. This condition lasted for about a week when the patient noticed a drooping of her upper lid and bulging of the left eye. Four weeks later, the patient was admitted to this clinic. On admission her vision was impaired. Physical examination showed marked ptosis and exophthalmos, a fixed, dilated pupil with paralysis of accommodation. There were no inflammatory signs. When the eyeball was pushed slightly it receded into the orbit. All muscular movements were absent with the exception of a slight downward torsion. The media were clear, the disc and fundus were negative. Teeth were carious and tonsils chronically inflamed. The Kahn test was negative. On the basis of this data a diagnosis of total ophthalmoplegia of unknown etiology was made. The patient was given mixed treatment for about three weeks and at present her eyelid had already recovered a portion of its function.

Discussion. Dr. A. C. Lewis had operated on a patient last May for convergent strabismus, doing a muscle resection. The recovery was uneventful but after three weeks there was a complete ptosis and ophthalmoplegia of the unoperated eye. All muscles but the superior oblique were involved. Nothing could be found as a cause except two bad teeth which were extracted, but mixed treatment was given with complete recovery.

Dr. J. B. Stanford thought that the ear infection did not cause the eye condition and that the Kahn test was nearly always negative in neurosyphilis.

Dr. Nicholson said that there had been three or four similar cases recently, all with positive Kahn reactions.

Choroid tigré

Dr. J. B. Stanford presented Mr. J. B., eighteen years old, who gave a history of always having had poor vision. His vision in the right eye was 1/200 and in the left eye 2/200. The maculae and areas surrounding them showed a "tiger-striped" pigmentation of the choroid. These pigmented stripes probably followed the choroidal vessels and might be the result of choroidal hemorrhages. The refractive error did not account for the poor vision. General physical examination was negative.

Glaucoma simplex

Dr. A. C. Lewis presented Mrs. M. R., aged fifty-two years, who was seen for treatment on November 14, 1932, with a history of failing vision for two years, much worse in the past three months.

On this date the vision in O.D. was 20/150, O.S. light perception only; no

headaches, pain, or soreness in the eyes. The anterior chambers were very shallow and pupils moderately dilated. Tension O.D. was 45 mm., O.S. 95 mm. (McLean). There was nothing in the general health to account for the glaucoma.

A scleral trephining was performed on each eye November 15th. Little filtration was obtained. Eserin and dionin were used but the tension remained high. The right eye, which had been the better eye, became congested and painful and the vision very poor.

On December 10th, the tension was 90 mm. in each eye. Four instillations of glaucosan at 15 minute intervals reduced this to 80 mm. Very violent head pains developed, requiring morphia. Two days later the tension was 70 mm. in each eye, to rise again. Deep iridectomies were then made, avoiding the trephine openings. Magnesium sulphate one-half ounce daily has been given to date. Urinalysis showed two plus albumen and many pus cells so urotropin had been administered for two weeks.

On January 9, 1933, the patient had made a general improvement. The tension in O.D. was now 27 mm. and O.S. 34 mm. The vision in O.D. was 5/100 and improving. There was no improvement in vision of left eye.

Ralph O. Rychener,
Secretary.

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MATHEMATICS FOR OPHTHALMOLOGY

Optics is a most important branch to study, in preparation for an ophthalmic practice. It is not taught in medical schools, and no one would think of including it as a necessary requirement, for entrance in a medical school. Most medical students have entered the medical school, expecting to study medicine as a whole, and supposing they will know all about it when they graduate, and be prepared, after a term of hospital work, to choose the branch of medicine each would practice. Therefore most graduates in medicine have no such knowledge of optics, as is essential for the modern practice of ophthalmology. When they choose this branch of practice, they must study optics.

Optics first attracted the attention of lens grinders, or astronomers who were advanced students of mathematics. Roger Bacon, Kepler, Descartes, Huyghens, Sir Isaac Newton, Thomas Young, Airy, Stokes, Maxwell, Helmholtz, all approached optics by means of mathematics. The books, papers and demonstrations on optics, were all filled with mathematics. Elementary books on optics took the attitude and copied the formulas of the standard treatises. Mathematics still remains the scholastic door to optics. The experimental method in physical science has changed this somewhat, but most of those who have mastered optics, even in recent years, do much of their thinking about it in terms of mathematical formulas.

It was inability to follow the mathematical demonstrations of optics, that prevented the medical profession from understanding the medical importance of optics for 500 years after spectacles had come into popular and general use. It still hinders the general medical profession from understanding the medical importance of errors of refraction. But nothing more than the ordinary high school and college mathematics is needed, for a good mastery of practical optics. The non-medical mathematician, or optical manufacturer, finds the medical profession as good a field for medical quackery, as any class in the community. The advertised, copyrighted name, is worth as much to opticians as it is to dealers in patent medicines. A

better understanding of optics would remedy this condition, and ophthalmologists can easily get such an understanding.

A long course in algebra and calculus may be necessary to read some famous books on optics, but it is not needed to understand the truths of optics, that have a practical bearing on the diagnosis and correction of errors of refraction. Geometric figures give a clear idea of the reflection and refraction of light, and elementary trigonometry, as taught in high schools, will give a practical mastery of aberrations, coflexures and transposition of lenses. These with such simple experiments as can be performed with a boy-scout flashlight, and the ordinary trial set, will put the eye physician beyond the reach of the salesman for copyrighted glasses.

It will not be long before we have good books on ophthalmology that do not start with trying to lead the student off into the mathematical wilderness; because there lies the path blazed out by the most famous writers on optics and physics in the past. Meanwhile eye physicians, who are young and ambitious enough really to master the ophthalmology of today and the future, will find efficient help for self-instruction. Such a student can begin by studying, or reviewing, plane geometry. Solid geometry, too, will give him a better mastery of space perception, and is not hard for one who has done the proper amount of reading for an undergraduate medical course. Then inquire about books on elementary trigonometry and obtain a book recommended for high school students. With that help, study plane trigonometry. Spherical "trig" also is good for any one who likes mathematics, but is not essential. With such preparation one can read Tscherning's Optique Physiologique, or the good English translation of it by Carl Weiland, Donder's or Landolt's Refraction of the Eye, or the parts of Helmholtz Physiological Optics, which were written by the great master himself. The mathematical wanderings of Gullstrand need not be taken too seriously.

Edward Jackson.

CHOICE OF OPERATION FOR RETINAL DETACHMENT

It is neither surprising nor inappropriate that the space devoted during the last few years to discussion of retinal detachment has been out of proportion to the incidence of this malady in ophthalmic statistics. Gonin revived in modified form earlier suggestions for the treatment of the condition, and at the same time put forward a very strongly supported opinion that retinal detachment was secondary to retinal laceration. While his theory is still much disputed, the value of his operative procedure has been rather generally admitted; but there has also been a great variety of effort to discover more convenient or more effective means of cure.

Since it is not likely that any method for treatment of retinal detachment will ever prove infallible, and since the efficacy of any given method will vary according to the enthusiasm and skill of the individual operator, the debate on this question is certain to be a protracted one. Several well known surgeons, with abundant clinical facilities for fair trial, have made comparison between Gonin's thermocauterization and its twin electrocauterization, Guist's and Lindner's chemical cautery, and the diathermy method of Larsson and Weve. Some have favored one, some another line of treatment, while a few workers find it difficult to select one method as superior to the others.

Praiseworthy are the attempts to try out the value of the different procedures upon animals, especially rabbits, in whom retinal tears have been produced experimentally; although, alike as to primary condition and as to the results of treatment, the comparability of artificial lesions in lower animals with more or less spontaneous lesions in the human subject will always be open to question.

Arruga of Barcelona has enriched the literature with a number of essays in which particularly he has discussed and beautifully illustrated the retinal tear, has reported many operative cases, and has suggested important modifications in technique of localization and operation. Before the Fiftieth Anniversary meeting of the Société Française

d'Ophtalmologie, July, 1932 (published in the Bulletins et Mémoires of the Society, and also in the Italian Annali di Ottalmologia, volume 60, page 473), Arruga described the production of "experimental adhesive choroiditis" in rabbits, and also in a young woman whose eye was to be removed three days later on account of choroidal sarcoma.

In cases treated by trephining of the sclera followed by chemical irritation of the choroid, or in diathermal applications, Arruga regards it as probable that adhesive choroiditis is the principal factor in recovery. In cauterization with the thermocautery other factors play a more important part.

The mode of action of the thermocautery (whether Paquelin or electric) was shown to vary according to whether the application was short or long. Whether the cautery point was white or red hot did not seem to matter much as regards its effect on adjacent tissues. But if the cautery was applied very rapidly the heat was not transmitted to these tissues and the effect was that of simple incision with very little inflammatory reaction; whereas if the application was slow the heat had time to be transmitted so as to produce the effect of a burn. Secondary contraction thus occasioned may explain the reduction of myopia after extensive cauterizations. Adhesion of retina to choroid only began to appear solid after four to six days.

Although Guist has offered his experiments on rabbits in support of the contention that potash is the most suitable caustic for provoking adhesive choroiditis, Arruga's findings did not suggest any difference between results obtained with caustic potash and those from caustic soda. Experimental cases treated by trephining followed by application of five percent solution of caustic soda showed adequate choroidal adhesion, with the advantage that no important neighborhood changes were produced in the retina. Satisfactory adhesions were also obtained experimentally with tincture of iodine or with a five percent solution of zinc chloride, immediately followed (as were all the milder chemical applications) by lavage with physiological salt solution.

Interesting effects were demonstrated after the use of diathermy according to Weve's technique; that is, applying the current through the round electrode long enough to produce "parchmentizing" of the sclera, a peculiar greenish-gray discoloration of the area of contact. (See also editorial, American Journal of Ophthalmology, 1932, volume 15, page 858). The inflammatory exudate developed in the subretinal space was fibrinous, and the choroid was greatly congested and was swollen to five or six times its normal thickness. More prolonged applications were quickly and definitely destructive. Both externally and ophthalmoscopically the changes visible after such applications were sharply delimited. Multiple diathermal electropuncture produced the same effects as superficial application of diathermy.

Arruga draws a sharp distinction between the mode of action of scleral trephining and of ignipuncture as regards closure of tears. After trephining and application of caustics, adhesion of retina to choroid is entirely due to adhesive choroiditis from chemical irritation. In thermopuncture, especially if rapid, almost no choroiditis is provoked, but vitreous hernia favors speedy adhesion of the retina to the edges of the scleral opening, and not elsewhere. It is for this reason that thermopuncture is followed by the most rapid healing, whereas those procedures which provoke choroiditis demand a more prolonged period of rest. On the other hand, the latter modes of treatment seem to be less subject to relapse of the detachment. W. H. Crisp.

OPTIC ATROPHY AND FLUID DROPPING FROM THE NOSTRIL

Nettleship, in 1882, reported a case of optic neuritis followed by dropping of fluid from the nostril. Before she was first seen, this patient had obscure cerebral symptoms, and for two months there had been profuse running of clear

water from the nose. Her optic discs showed post-papillitic atrophy, which was unchanged during the year she had been under observation. Nettleship noted two cases previously reported, one by Sir James Paget and one by Dr. Baxter.

In the same number of the Ophthalmic Review (January 1883) Priestley Smith reported two cases of the kind, that he had seen. In one the dropping continued for over two years. In the other the dropping of fluid from the right nostril had continued for six months, and amounted to 18 fluid ounces in the 24 hours. It was thought, possibly to come from the frontal sinuses. In the other case brain symptoms had been noticed six years before, and two years and one half after that, when he was recovering power in his legs, the dropping of fluid began.

The same year, Leber reported a case of the kind (Graefe's Archiv) starting with hydrocephalus. He also reviewed the previously reported cases. In his case the fluid contained a substance that reacted as sugar, to the Fehling test, and he concluded that the fluid was derived from the cerebrospinal fluid. In some other cases there was no evidence of a reducing substance allied to sugar, but this might be due to dilution by nasal secretion, or to defective tests. In one case the thickening of the nasal mucous membrane, on the side of the dropping fluid, was taken as evidence that it was the source of the discharge. But it might have been that the thickening was due to the maceration, with fluid from another source.

In the cases that have been examined post mortem, no one has discovered any channel for the fluid from the cerebral ventricles to the nose, and the essential nature of such cases has remained in doubt. In the Archives of Oto-Laryngology (v. 14, p. 611) Carroll Smith and L. Walter report a case in which roentgenograms showed evidence of pituitary disease. Frontal operation disclosed a cystic growth of the pituitary body. Puncture and fulguration were followed by recovery; which appeared complete seven months later. The exact fistulous tract was not traced; but bone absorption suggested an opening into the sphenoid, from which the fluid drained from normal channels.

Other cases have been reported in the literature of oto-laryngology; but their pathogenesis remains obscure. They are rare, but worthy of most careful study, and a better understanding of them may throw light on other obscure conditions of cerebral pathology. Some light may be expected from the different methods of examination with the Roentgen rays.

Edward Jackson.

COMPARISON OF METHODS OF INTRACAPSULAR CATARACT EXTRACTION

Since the introduction of linear extraction of cataract, undoubtedly the most important contribution to the method of operating for this condition, excluding asepsis, has been the development of intracapsular extraction.

The beautiful clear pupils in the successful cases certainly surpass anything that can be accomplished by operations in which the capsule is ruptured. With the standardizing of an improved technic, increasing numbers of ophthalmologists are adopting this operation. There are two methods which have found most favor; one being that in which the capsule is seized with forceps and the lens, loosened from the zonule by various rotations, tractions and counterpressures is delivered through the incision and the other in which the lens is sucked into a vacuum cup, lifted from its bed and out of the eye.

For the former method it may be said that it requires only one small instrument, the capsule forceps, in addition to the usual equipment for cataract extraction and that if the capsule ruptures the extraction may be carried out in the usual manner. Rupture of the capsule does take place fairly frequently even in the hands of the most skilled. The procedures involved do not differ radically from those employed in the extracapsular method so present nothing very unusual for the surgeon.

The suction apparatus is complicated and expensive. It requires a considerable amount of practice for its manipulation and a well trained surgical team is almost a necessity. It is clearly a logical method and in the hands of a skilled operator appears simple.

Most ophthalmologists are still hesitating about undertaking intracapsular extraction because of excellent results with the older method and lack of desire to make the necessary effort to learn a new procedure and especially one in which two very different methods are advocated. They are watching to see which method is going to prove the better. Their operative opportunities are limited and it is of the utmost importance that they do the best that is possible for every one of their patients. Poor results during the period of training would be intolerable. Anything that will throw light on the relative merits of these two technics is naturally of great interest to them.

Professor Barraquer, champion of the suction method, presents in this issue of the Journal a comparison of the two methods as illustrated by operations on the eyes of fresh cadavers. He has operated on one eye of each cadaver by the forceps method and on the other eye by the vacuum cup method. Certainly there are criticisms that can be justly made of such a comparison but the illustrations and comments seem worthy of consideration as throwing light on the manner in which the two procedures may act. More illustrations of a kind similar to those printed were sent with the article but only those necessary to demonstrate the author's points were used.

That this shows only one small phase of the subject is obvious. It does not bring out the difficulties of the vacuum cup technic.

It seems probable that intracapsular operations will become increasingly popular. The removal of the lens with the vacuum cup appears to be an excellent method but because of its simplicity the capsule forceps procedure will probably be the one most frequently used, at least in the early attempts of the individual. Whether either will be used to the exclusion of the other is doubtful. The hope of a method of absorption of the lens with its opacities *in situ* may some day emerge from the limbo of dreams.

Lawrence T. Post.

BOOK NOTICES

The Blind in School and Society. A Psychological Study. By Thomas D. Cutsforth, Ph.D. Instructor in Psychology in the University of Kansas. 283 pages. New York and London. D. Appleton and Co. 1933. Price $2.00.

This new book contains new matter, of value to the Physician, Psychologist, the Teacher and the Social Worker. It throws new light on the psychology of the blind, and on the general influence of sense defects on the life and thinking of those who are thus defective. Of late years students of psychology have found the physiology of vision an important field for original research. But few have brought forth such important practical results, as are set forth in this book. The first chapter takes up "The preschool blind child," and shows how the observations, thinking and education of the blind must differ from those of the seeing. Even Helen Keller, becoming blind and deaf at nineteen months, had a mass of visual experience and coordinations that those who are blind from birth can never get.

Other chapters deal with these subjects: (2) A case of retardation. (3) Verbalism; words versus reality. (4) The phantasy life of the blind. (5) Voice and speech. (6) Problems in the emotional life of the blind. (7) Sex behavior of the blind. (8) The esthetic life of the blind. (9) Personality problems in institutions for the blind. (10) Social adjustment in a college community.

The analysis of sex behavior, personality and social relations of the blind, suggests various problems in education and child development that need investigation, recognition and attention from other points of view.

There are appendices on Problems for further study, and References. There is an index of five double column pages, arranged by the chapters, which refer

to the subjects dealt with in the literature. The whole is well printed in good type, setting an example that will be appreciated by those who have to deal with blindness. The unique value of this book appears, when we know that the author became blind at the age of eleven years; and continued his studies to a Master's Degree, from the University of Oregon. Edward Jackson.

Glaukom und Netzhautzirkulation (Glaucoma and retinal circulation). By Maximilian Salzmann. Paper covers, 68 pages, 41 illustrations in the text. Price 8 marks. 1933, Verlag von S. Karger, Berlin.

This monograph is reprinted from part fifteen of Abhandlungen aus der Augenheilkunde und ihren Grenzgebieten. It presents in some detail the pathologic findings in a series of eyes which had been enucleated after symptoms of absolute glaucoma; and the condition of these eyes is viewed especially as regards the relation between glaucoma and the circulation in the central retinal vein. There has been a good deal of discussion as to the reciprocal relationship between glaucoma and venous obstruction as cause and effect. The production of glaucoma by venous obstruction has long been recognized, but venous obstruction secondary to glaucoma has been regarded as exceptional. Salzmann is disposed to regard the two conditions as constituting a sort of vicious circle. Some importance is attached to an intercalary tissue (Schaltgewebe) described by Elschnig in 1899, and found by Salzmann in about one-third of his eighty cases. This tissue, which arises at the optic disc and penetrates into the supportive structure of the nerve head, probably has an important influence in producing compression of the central vein. W. H. Crisp.

Corresponding Retinal Points, The Horopter and Size and Shape of Ocular Images. By A. Ames, Jr., Kenneth N. Ogle and Gordon H. Glidden. Paper, Octavo, 96 pages, 61 illustrations. Hanover, New Hampshire, 1932.

This is a report of work done in the Department of Research in Physiological Optics, Dartmouth Medical School, and is a reprint from the Journal of the Optical Society of America, vol. 22, pp. 538-631. It describes exact observations, made with newly devised laboratory instruments, carried on with great exactness and attention to details, and interpreted from the points of view of the physicist, pathologist and mathematician.

The summary of this work holds: That "the concept that associates specific subjective directional values (lines of direction, Helmholtz) with specific cortical centers is fundamental. The optical projections of the retinal points represent the effective distribution of the spatial values, associated with the specific cortical centers to which the retinal points are connected."

The general conclusions are given thus:

"(1) The studies indicate that the relationship between subjective and objective space and directional values are subject to more exact measurement, than had heretofore been recognized.

"(2) They indicate that a mathematical comprehension and formulation of the empirical longitudinal horopter data are possible; first, through an improved method of obtaining, handling, and analyzing the empirical data; second, through the elimination of those factors that can be neglected; and, third, through empirically checking the magnitude of changes introduced by known factors.

"(3) It would appear that the fundamental hypothesis of specific directional values associated with specific brain centers is placed on a firmer basis.

"(4) It would appear that certain complex phenomena associated with binocular vision, heretofore calling for psychological interpretation, have been given a physiological explanation."

If the methods of exact mathematical analysis and broad deductions here used, should be applied to the groups and associated impressions, received from the rods near the periphery of the retina, it is probable that our knowledge of the peripheral fields of vision and of

retinal and cerebral physiology, would be made more exact, and materially extended. Edward Jackson.

La Terapia del Distacco Retinico Idiopatico (The therapy of idiopathic retinal detachment.) By Dario Sabbadini. Extracted from the Proceedings of the Italian Ophthalmological Society, 1931. Paper covers, 204 pages. Price not stated. 1932, L'Universale Tipografia Poliglotta, Rome.

This thesis was prepared by special request for the twenty-first meeting of the Italian Ophthalmological Association in 1928. It contains an elaborate historical review of retinal detachment and its treatment, and a particularly careful account of recent methods, including those of Gonin, Guist, Lindner, Arruga, and Sourdille.

The author thinks that cures obtained by methods antedating that of Gonin were probably based upon closure, either spontaneous or accidentally induced, of retinal tears which had not been previously recognized. The monograph is accompanied by an extensive bibliography as far as the latter part of the year 1931. W. H. Crisp.

Bulletin, Ophthalmological Society of Egypt, Vol. XXV, 1932. Paper Octavo, 255 pages. Illustrated by 23 plates. Cairo, Msr. Press, 1932.

This is the largest volume of Transactions issued by this Society, and it must be recognized as an important contribution to the current world literature of ophthalmology. It tells of the 30th annual meeting of the Society, held in the Memorial Ophthalmic Laboratory, Giza, March 25, 1932. It has both scientific and historic value. The Presidential Address, by Dr. M. Khalil goes into the history of the Society, the welfare of the blind in Egypt and the connection of trachoma with blindness. There is also a commemoration of "MacCallan's Twenty Years Service in Egypt," (1903-1923). There are photographs of Dr. MacCallan, and the bronze memorial bust of him, given by his pupils and colleagues, and unveiled in March, 1931. There is also his message of thanks on that occasion, pointing out that "association with ophthalmic work in Egypt has been the direct cause of my obtaining honorary hospital appointments in London." There is also an account of the visit of Dr. M. Azmy El Kattan to America, to attend the New York Congress for the Welfare of the Blind, in April, 1931.

On the scientific side, there are notable papers on Tattooing of the cornea with platinum chloride; Treatment of anterior staphyloma with galvanociliarotomy; Operations of Gonin and Sourdille for detachment of the retina; and over twenty other papers on practical subjects, including treatment of trachoma with intramuscular and intravenous injections. There is a paper on Slitlamp study of the corneal vessels in Egyptian trachoma, by Dr. Rowland P. Wilson, Director of the Giza Laboratory. This article is illustrated by two plates in colors, showing the vessels in the limbus in normal and trachomatous eyes. Wilson finds that: "Pannus, in one form or another, is invariably present in the disease, and is therefore not a complication but a part of it." There is also a paper on "Pituitary tumors and others in relation to the sella turcica," which should receive attention, for its x-ray pictures of the sella and field charts.

In its arrangement and contents this volume shows the influence of the practical English mind, upon a new center and school of ophthalmology.

Edward Jackson.

OBITUARY

Edward Treacher Collins, F.R.C.S.* 1862-1932

Collins was known around the world for his steady industry, his sturdy scientific sense, his helpfulness to all who worked in his profession, his freedom from greed of wealth or honors. He illustrated the practical wisdom and devotion of British science to human needs. He was never the professor of

* See also American Journal of Ophthalmology. March, 1933.

a medical school, the towering head of a great surgical clinic, the inventor of a famous instrument, or operation, or the discoverer and teacher of a revolutionary idea in medicine or surgery. He was never knighted like his brother, Sir William. But by his honest, persistent, unselfish work and study he came to be a great leader in the most developed branch of specialized modern medicine and surgery.

When his studies in University College and the Middlesex Hospital brought him the conjoint diploma, at the age of twenty-one years, he became a House Surgeon at Moorfields; and at twenty-four years he was appointed Pathologist and Curator of the Museum and Librarian. In 1888 he prepared an index of the first seven volumes of the Ophthalmic Review. The number of specimens and drawings of the fundus in the museum had been largely increased under C. Bader, who was an expert in making such things. But specimens prepared by older methods did not prove permanent. Vernon was curator from 1867 to 1871, and Nettleship who followed him, while serving as assistant to Jonathan Hutchinson, had introduced the preservation of specimens in glycerine jelly. Brailey had succeeded him in 1874, and introduced courses of instruction on the practical pathology of the eye.

As pathologist, Collins turned his chief attention and devoted most of his time to histopathology of the eye, and came to be recognized as an authority on that subject. He made his facilities fully available to his colleagues, and from that time the Transactions of the Ophthalmological Society of the United Kingdom showed the influence of his work. Among the many papers, discussions and addresses he contributed to the Society from 1885 to 1930 inclusive, 150 of them have referred to points in histology or pathology; many of these being case reports in which he contributed the facts of the pathology in a case, of which the clinical history was given by another. His Hunterian Lectures formed the basis of his book on "Researches into the anatomy and pathology of the eye", published in 1896. His book on the "Pathology and bacteriology of the eye" published in 1911, was republished with the collaboration of Mayou in 1925.

When Collins became connected with the "Moorfields Hospital", Bowman, Critchett and Jonathan Hutchinson had retired. But of the surgeons still on the staff, all but Nettleship and Marcus Gunn, had held positions in general surgery in other hospitals. After that time those elected to the full staff had generally committed themselves to ophthalmic practice exclusively, and after Collins' election in 1895 those who followed were nearly all similarly committed. He lived through the period of reorganization of surgery and medicine upon the basis of specialization in practice, at least for all large cities and the populations having immediate access to medical centers.

In America, Collins is especially remembered for his visits to the western continent. In 1908 he attended the meeting of the American Medical Association in Chicago, and delivered before the Section of Ophthalmology an address on "Developmental deformities of the crystalline lens".

In 1922 Treacher Collins attended the International Congress of Ophthalmology at Washington, served as Vice-president, and gave a most important address on "Hereditary ocular degenerations—Ophthalmic abiotrophies"; and contributed largely to the success of the Congress. He also presented an invitation to hold another International Congress in 1925 at London. This was supported by Professor Gallemaerts of Belgium, Professor Gullstrand of Sweden, and eminent ophthalmologists of Great Britain, and approved by the meeting.

When the time came, it was found wise only to attempt a meeting of English-speaking Ophthalmological Societies at London; over which Mr. Collins presided gracefully and efficiently. But out of that meeting developed the organization that resulted in the formal resumption of the series of International Ophthalmological Congresses, in 1929 at Amsterdam and The Hague. That meeting was successfully held under the rules

drawn up in 1927, by the Committee of which Mr. Collins was Chairman.

When time permits a final estimate of Collins' work in the development of ophthalmology, it may appear that his most important contribution has been in calling attention to the evolution of the eye and related organs concerned in vision, and to the occurrence and relations of their congenital defects and inherited diseases. In 1887 he published a paper and reported a case of anophthalmos, in 1891 a case of aniridia and glaucoma, and in 1904 congenital opacities of the cornea in brother and sister. In addition to the above and the two addresses in America, his Bowman Lecture in 1921 was devoted to the "Changes in the visual organs correlated with arboreal life and the erect posture". The Bowman Lectures since, by Sir John Herbert Parsons, 1925, and Prof. Elliot Smith, 1928, and the Presidential Address by Mr. Leslie Paton (1930) have extended the applications of the theory of evolution to the visual functions, along lines such as were pursued by Collins.

Edward Jackson.

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy and embryology

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1. GENERAL METHODS OF DIAGNOSIS

Krantz, W. and Von Hofe, K. **Reaction of tuberculous rabbits to intracorneal injection of foreign serums.** Arch. f. Augenh., 1932, v. 106, Dec., p. 554.

The authors found that intracorneal injection of horse serum produced a marked reaction in rabbits that had been infected with tuberculosis for a period of three weeks. In rabbits whose tuberculous infection had been present for eight weeks or more, the reaction was decidedly milder.

Frederick C. Cordes.

Schmidt, K. **Measurement of blood volume in rabbits' eyes by means of a radioactive indicator.** Arch. f. Augenh., 1932, v. 106, Dec., p. 504.

Continuing previous work, Schmidt found that after trauma the resulting hypotony was associated with an increase in blood volume. With atropin there was reduction in volume, while with pilocarpin and eserin there was decided increase. The drugs used in glaucoma (pilocarpin and eserin) produce in the normal rabbit eye a hyperemia of the degree produced by inflammation of the eye following corneal inoculation with herpes virus.

Frederick C. Cordes.

2. THERAPEUTICS AND OPERATIONS

Gifford, S. R., and Smith, R. D. **Effect of reaction on ophthalmic solutions.** Arch. of Ophth., 1933, v. 9, Feb., pp. 227-233.

The effect of drugs introduced into the conjunctival sac in solution is much influenced by their acid or alkaline reaction. Irritation is produced to a far greater extent by reaction than by osmotic pressure. Certain drugs are used preferably in acid solutions, others in alkaline solutions. The pH of the commonly used drugs, as prepared in distilled water, is given, and three buffer solutions are suggested which may be substituted for distilled water. Solution 1 is made as follows:

Boric acid	6.2 gm.
Potassium chloride	7.4 gm.
Distilled water	1000 c.c.

This is known as the acid solution; its pH is 5.5. Solution 2 is a fifth-molar solution of sodium carbonate, containing 21.2 gm. of sodium carbonate to the liter of distilled water. This solution is used only in making solution 3, known as the alkaline buffer solution. One cubic centimeter of solution 2 is added to 50 c.c. of solution 1, producing a reaction of pH 7.6. These solutions also have a certain preservative action, tend-

ing to prevent deterioration and infection. The acid solution is recommended for drugs such as zinc, phenacaine, cocaine and epinephrin; the alkaline solution for atropin, homatropin, physostigmin, and pilocarpin. The alkaline buffer solution used alone is nonirritating and is suitable for cleansing the conjunctival sac and for supplying a lack of tears.
M. H. Post.

Leoz Ortin, G. **Local hypertonic injections in ocular therapy.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 72.

Hypertonic injections are of no value in acute conditions, particularly of the anterior segment. Their indications are chronic affections exhibiting a tendency to phthisis bulbi, such as malignant myopia, fluidity of vitreous, chronic uveitis, embolism and thrombosis, retinitis, and simple hypotony, irrespective of etiology. The drug employed is of less importance than the hypertonicity. The effect is a spur to circulation rather than production of adhesive inflammation, to which Sourdille attributes the efficacy of such injections in retinal detachment. Adhesive inflammation is the natural terminal process of certain diseases (as in pleural and pericardial adhesions) and is perhaps hastened by the inflammatory reaction, but is not desirable. Two solutions are used—a solution of dionin in ten per cent saline and, for greater effect, a 5:10,000 mercury cyanide solution; the former daily for six to eight days, and repeated twice yearly, the latter once weekly for six to eight weeks, and also twice yearly.
M. Davidson.

Marin Amat, M., and Marin Enciso, E. **Cocaine in ocular therapeutics.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Jan., p. 43.

On the occasion of an inquiry by the Academies of Science, the writer reviews the pharmacology of cocaine and concludes that cocaine is the most valuable remedy of its kind in ophthalmology and cannot be replaced by any other agent. M. Davidson.

Wilmer, W. H., and Paton, R. T. **Pantocain as a local anesthetic in ophthalmology.** Amer. Jour. Ophth., 1933, v. 16, Feb., pp. 106-109. Trans. Amer. Ophth. Soc., 1932, v. 30.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Ames, A., Jr., Ogle, K. N., and Gliddon, G. H. **Corresponding retinal points, the horopter and size and shape of ocular images.** Jour. Optical Soc. of Amer., 1932, v. 22, Oct. and Nov., pp. 537-631.

This monograph on a highly technical subject of importance in relation to physiologic optics and the cerebration of vision is divided mainly into an introductory discussion of the subject, a description of the special apparatus employed, an account of the experimental procedure used, a review of the experimental findings, and conclusions. The authors state that the relationship between subjective and objective space and directional values appears to be subject to more exact measurement than had heretofore been recognized. Mathematical comprehension and formulation of the empirical longitudinal horopter data are possible by improved methods. An attempt is made to place the fundamental hypothesis of specific directional values associated with specific brain centers on a firmer basis, and to give physiological explanations for certain complex phenomena associated with binocular vision which heretofore were regarded as calling for psychological interpretation. W. H. Crisp.

Bieringer, Stephan. **Myopia extraction after successful keratoplasty.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 43. (Ill.)

On both eyes of a woman aged twenty-eight years, suffering from congenital luetic parenchymatous keratitis and grave myopia, keratoplasty was performed with great improvement of vision. As the patient declined correcting glasses for cosmetic reasons a myopia lens extraction was done on the left eye eight months later. After four months right vision was 6/24 with —18.00 sph. and left vision was 6/60 with —3.00 cyl. axis 170°.
C. Zimmermann.

Engelking, E. **Color weakness and artificial temporary color blindness.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 9. (Ill.)

Engelking retested on the anomaloscope a number of students whose color sense as examined with Stilling's and Ishihara's plates was without doubt normal. Yet a few minutes observation of saturated colors sufficed to make their eyes appear color-blind. They thus represented a transition between normal trichromatism and red-green blindness. A similar relative dichromatism is represented by the deuteranopic state of color asthenopes. A third form is the deuteranopia resulting from exhaustion of the deuteranomalous system and a fourth type is the dichromatic vision found in some diseases of the visual paths. According to the author's investigations deuteranopia may also be conceived as an immediate reduction from the normal. C. Zimmermann.

Jackson, Edward. **Vision for equilibrium and orientation.** Trans. Pacific Coast Oto-Ophth. Soc., 1932, 20th annual meeting, p. 15.

The author traces equilibrium and orientation through the lower animals to man. In human beings, vision plays an important part in orientation. More frequently than realized, poor vision underlies loss of balance in the aged. The nervous system and its coördinations are chiefly developed with reference to the sense of sight. The muscle sense keeps us in relation with gravitation at all times, to correct or supplement vision. (Discussion.)

M. E. Marcove.

Ogle, K. N. **Analytical treatment of the longtitudinal horopter; its measurement and application to related phenomena, especially to the relative size and shape of the ocular images.** Jour. Optical Soc. of Amer., 1932, v. 22, Dec., pp. 665-728.

This is a highly technical and mathematical paper, supplemental to previous papers on the same or related subjects by (1) Ames, Gliddon, and Ogle; (2) Carleton and Madigan; (3) Ames and Ogle; and (4) Ames, Ogle, and Gliddon. Considering the sum total of the optical projections of corresponding retinal elements as constituting two projection fans emerging from each eye, the size and shape of the ocular image may be calculated according to formulas given in section three of the essay.

W. H. Crisp.

Pascal, J. I. **New Conception of dioptric power.** Arch. of Ophth., 1933, v. 9, Feb., pp. 244-247.

A so-called reduced focal length, arrived at through resolution of the two actual focal lengths, has been adopted, and the reciprocal of this value accepted for the refracting power of the surface of the system. A simple formula for determining these relationships is given.

M. H. Post.

Quaglio, C. **The action of the ultraviolet rays on visual acuity.** Ann. di Ottal., 1932, v. 60, Aug., p. 577.

A series of experiments were made to determine to what degree the different parts of the spectrum affected acuity of vision, using as a test object the broken ring of Landolt, and testing in bright daylight, under an ordinary 200-watt lamp, and with the mercury vapor light. The best vision was obtained with daylight from which the ultraviolet rays were excluded but with proportionate increase in the illumination to balance this exclusion. But the author does not take into account the size of the pupil as modifying the acuity.

Park Lewis.

4. OCULAR MOVEMENTS

Ohm, J. **Optokinetic nystagmus and nystagmography in brain diagnosis.** Arch. f. Augenh., 1932, v., 106, Dec., p. 530.

Continuing his work, Ohm studied nystagmus in choked disc, tabes, motor aphasia and lethargic encephalitis. He concludes that optokinetic right nystagmus and vestibular right nystagmus in light are about the same in amplitude but differ in frequency. In the dark, vestibular nystagmus almost disappears. From the author's earlier work,

it is apparent that the nystagmus caused by turning produces in daylight optokinetic and vestibular nystagmus, while in the dark only the latter is present. It is apparent that in this instance the vestibular reflex apparatus is involved more than the optokinetic and to a great extent primarily on the right side. Frederick C. Cordes.

Roche, W. J. **The etiology of miners' nystagmus.** Trans. Ophth. Soc. United Kingdom, 1932, v. 52, pp. 529-538. (See Amer. Jour. Ophth., 1933, v. 16, Feb., p. 169.)

5. CONJUNCTIVA

Addario, C. **The pathogenesis of conjunctival and corneal trachoma.** Ann. di Ottal., 1932, v. 60, Aug., p. 562.

The author regards trachoma as presenting two morbific processes both originating from the same cause, namely a specific bacterium: a neoplastic formation which gives place to numerous miliary granulomas penetrated by the organism, and an inflammatory or reactive condition arising from the toxin given off by the germ, which in time causes various degrees of conjunctival hypertrophy, later giving rise to fibrous connective tissue. The pathologic anatomy is discussed in detail.

Park Lewis.

Caocci, G. **A voluminous cyst of the glands of Krause, containing blood.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 800.

Caocci observed a cystic tumor of the superior conjunctival fornix in a fifty-two-year-old woman. The cyst presented a connective tissue wall covered by a single layer of epithelial cells. The contents consisted almost entirely of blood, mixed with exfoliated epithelium. The hematic cyst developed from occlusion of the excretory ducts of a Krause's gland which had been obliterated by a chronic trachomatous process. The cyst had been distended by hemorrhage into its cavity. The mass measured 16 by 9 by 6 mm. (Six illustrations.) Eugene M. Blake.

Esteban, M. **Experiments in local immunotherapy in trachoma.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 91.

Trachomatous material, gently expressed, without drawing blood, was mixed with salt solution, inactivated at sixty degrees, filtered, and used in daily instillations in the right eye of the same individual, the left eye being used as a control. The results were 80.95 percent cures, without traces of trachoma, after a varying period of treatment, both being alike benefited. The writer concludes that the vaccine applied to one eye immunizes the other as well, just as vaccination against smallpox immunizes the whole skin system.

M. Davidson.

Kayser, B. **Two rare cases of pigmentation of the eye.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 777. (Ill.)

Six or seven years earlier a healthy woman of seventy-one years had noticed a small brown spot on the caruncle of the left eye, which grew and proved to be a pigmented nevus. A healthy man showed around the limbus of each eye intense brown pigmentation over the episcleral vessels and the cornea, close to the marked gerontoxon but not into it. As the family of the patient had immigrated a long time ago from the east, he may have borne the blood of foreign races. C. Zimmermann.

Lauterstein, M. **Trigemino-ciliary ophthalmopathy.** Zeit. f. Augenh., 1933, v. 79, Jan., p. 370.

The author proposes this name for the cases of chronic simple conjunctivitis in which the subjective disturbances are extremely severe and the objective findings negligible. When Schnaudigel treated such patients with extremely small doses of tuberculin and called the disease neuroallergic conjunctivitis, Meller stated that he believed the therapy was effective only through suggestion. On this basis the author has succeeded in relieving many patients with therapy which could only have been successful on the basis of suggestion, for example, irradiation

with the slitlamp, among others. Of course suggestion often fails.

F. Herbert Haessler.

Redslob, E. **A contribution to the study of the nature of pterygium.** Ann. d'Ocul., 1933, v. 170, Jan., pp. 42-59.

This work is based on a histological study in which the author distinguishes between progressive and stationary types. He speaks of the growth as a hyperplastic tumor (Photomicrographs, bibliography.)

H. Rommel Hildreth.

Sal Lence, G. **Actinic conjunctivitis.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 104.

Having observed numerous cases of conjunctivitis, with photophobia, lacrimation, and burning, but without secretion, alike among children undergoing heliotherapy at the seashore and coming from the Castilian plateau with its high isolation, the author concludes that the conjunctivitis is actinic in origin rather than thermal, and is due to the vasodilator effect of actinic rays.

M. Davidson.

Chavarria Lopez, F. A. **Orbital suppuration from foreign body.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 107.

An unusual case of penetration of numerous fragments of hard clay through a wound of the lower lid is reported. The cause of the suppuration was not clear until exploration dislodged the stones. M. Davidson.

Sinai, A. **Trachoma among the Jews of Yemen (Southern Arabia).** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 83.

Trachoma is less prevalent in Yemen (Southern Arabia) than in Egypt, Palestine, and the rest of the Near East, and follows a milder course. Many Yemenite Jews immigrating to Palestine become infected either on the way or in Palestine itself. Infection from parents occurs in only ten percent of the Yemenite families, and children are ordinarily infected by contact with their playmates. About twenty percent of trachomatous patients are infected in their second year, forty percent in their third year, and the remainder later in life. Phillips Thygeson.

Taborisky, J. **The microscopical diagnosis of trachoma.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 34.

Taborisky discusses the microscopic signs under (a) bacteriological, (b) cytological, and (c) histological examination. In regard to (a) he states that the microflora of trachoma does not differ markedly from that of the normal eye. In Palestine numerous Koch-Weeks bacilli, pneumococci, or Morax-Axenfeld bacilli when found in acute conjunctivitis usually signify a simple inflammation, but mixed infections with trachoma are not rare. If bacteria are absent or are present in small numbers, trachoma is suggested. In reference to (b) Taborisky states that exudate films are of little value as compared to epithelial scrapings. As to (c) Taborisky states that histologically the characteristic signs of trachoma are transformation, degeneration, and proliferation of the epithelium as well as diffuse pathologic alterations of the subepithelial tissue. The cardinal difference between follicular conjunctivitis and trachoma is in the condition of the epithelial lining, which remains normal in follicular conjunctivitis.

Phillips Thygeson.

Vancea, P. **Primary posttraumatic tuberculosis of the conjunctiva.** Ann. di Ottal., 1932, v. 60, July, 0.

In a youth of sixteen years an edematous purplish tumefaction sensitive to pressure appeared on the right lower lid some weeks after a foreign body had been removed from the conjunctiva. On the inner surface of the lid were nodular enlargements of the size of grains of rice. On the external surface of the lid was an indolent, indurated, vegetative ulcer with irregular borders. There were also preauricular swellings. The growth was extirpated and the wound cauterized with the galvanocautery, and later it was given roentgen irradia-

tion. In the center of the neoplasm were numerous nonvascular nodules. Section showed a multistratified central zone with many giant cells. Koch bacilli were not found. (Illustration, bibliography.) Park Lewis.

6. CORNEA AND SCLERA

Addario, C. **The pathogenesis of conjunctival and corneal trachoma.** Ann. di Ottal., 1932, v. 60, Aug., p. 562. (See Section 5, Conjunctiva.)

Filatow, W. P. and Welter, S. L. **Corneal transplants.** Arch. f. Augenh., 1932, v. 106, Dec., p. 466.

The authors report their subsequent observations on ten cases of corneal transplants previously reported. The results obtained soon after operation have remained essentially unaltered.
Frederick C. Cordes.

Illes, Peter. **Roentgen therapy in episcleritis.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 72.

Thirty-eight cases of episcleritis were very cautiously treated with roentgen rays. Ten were complicated by keratitis, 12 were due to tuberculosis, 7 to rheumatism, 19 were of unknown etiology. Six healed after one, 13 after two, 12 after three radiations, 4 remained unchanged, 3 were impaired, as shown by the clinical histories. The results were better in tuberculous and focal than in rheumatic and diffuse affections. The author concludes that roentgen treatment is indicated in all cases in which other general and local therapy has failed. C. Zimmermann.

Kayser, B. **Diagnosis and differential diagnosis of megalocornea and incidental pigment migration.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 770. (Ill.)

Proofs that megalocornea is independent of hydrophthalmos, by Kayser and Grönholm, are here again enumerated. Megalocornea occurs in perfectly normal eyes without a trace of hydrophthalmos. Characteristic is almost exclusive limitation to males, to whom it is transmitted by the female members of the family; also bilaterality, regular astigmatism, and normal radius. One patient acquired a spindle in the left cornea at twenty-three years and in the right cornea at twenty-five years, with scattering of pigment on the iris for which no explanation is given.
C. Zimmermann.

Kayser, B. **Two rare cases of pigmentation of the eye.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 777. (Ill.) (See Section 5, Conjunctiva.)

Kurz, Otto. **Keratoconus and its treatment.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 36.

In fourteen cases treated within the last twenty years at the Elschnig clinic, the female sex preponderated, and the critical age for beginning the disease was generally at the transition from the second to the third decade. In eight out of eleven cases contact glasses improved vision considerably. If these were not tolerated the apex of the cone was broadly cauterized with the slightly red galvanocautery. Anatomically the aim of the method (flattening of the cone and solid scar) was fulfilled in every case. C. Zimmermann.

Mata, P. **Aurotherapy in scrofulous ophthalmias.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Jan., p. 9.

The author regards scrofulosis as infection with a filtrable or granular infantile form of the adult acid-fast bacillus of Koch in subjects of low resistance. In the absence of a specific tuberculin for this form, neither tuberculin nor immune body treatment is logical; and chemotherapy, in the form of the gold and sulphur compound allocrysin, has given the most encouraging results.
M. Davidson.

Much, V. **Contact glasses. 2: Contact-glass therapy in keratoconus together with a group of illustrative cases.** Arch. f. Augenh., 1932, v. 106, Dec., p. 399.

Much feels that, after continued use of contact glasses in keratoconus, there is a flattening of the cornea. Whether or not this improvement of the cornea is permanent can be determined only after years of observation. The author

was unable to determine any therapeutic difference between the ground contact glasses of Zeiss and the blown glasses of Müller. The author's conclusions are based on sixteen cases.
Frederick C. Cordes.

Pfingst, A. O., and Townes, C. D. **Endarteritis obliterans with spontaneous gangrene of both corneae.** Amer. Jour. Ophth., 1933, v. 16, Jan., pp. 39-50. Trans. Amer. Ophth. Soc., 1932, v. 30.

Schafer, F. **Case of deep pustuliform keratitis with hemorrhage in the anterior chamber following intravenous neosalvarsan.** Arch. f. Augenh., 1932, v. 106, Dec., p. 559.

Schafer reports a case of deep pustuliform keratitis with positive blood and spinal fluid. Following the first intravenous neosalvarsan, there was a hemorrhage that filled the lower two-thirds of the anterior chamber. This the author regards as a Jänsch-Herxheimer reaction. Under further neosalvarsan therapy, there was no reaction and the eye continued to improve. When last seen, the inflammatory signs had almost subsided. Frederick C. Cordes.

Schweinitz, G. E. de., and Cowan, Alfred. **An unusual corneal lesion, probably congenital and familial in character.** Amer. Jour. Ophth., 1933, v. 16, Jan., pp. 7-11. Trans. Amer. Ophth. Soc., 1932, v. 30.

Zykalenko and Welter. **Transparent corneal transplantation in traumatic leucoma.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 44. (Ill.)

Five months after an injury the right cornea of a carpenter aged thirty-one years showed a leucoma without ectasia. Vision was counting fingers at one meter eccentrically. Since the lesion had not been a penetrating one, the leucoma was not dense, and the anterior chamber was normal, the case was treated by transplantation. The anterior chamber was not restored until the fifth day. After two months the flap was transparent and after six months vision was 0.4. Contact with transparent corneal tissue is important for the later fate of the flap. C. Zimmermann.

7. UVEAL TRACT, SYMPATHETIC OPHTHALMIA, AND AQUEOUS HUMOR

Berens, C., and Posner, A. **The circulation of the intraocular fluid.** Amer. Jour. Ophth., 1933, v. 17, Jan., pp. 19-28. Trans. Amer. Ophth. Soc., 1932, v. 30.

Bertoldi, M. **Nodular infiltration of the iris in chronic iridocyclitis. Its relationship to tuberculosis.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 922.

Five cases of chronic iridocyclitis, in which histological examination revealed the presence of nodules in the iris, are described by Bertoldi. Sections showed prevalence of lymphocytes and giant cells. Lack of clinical research leaves the etiology unknown in four cases. In the fifth, radiographic study of the lungs, positive skin test, and definite finding of the bacilli in the blood (Löwenstein's method) were positive evidence of tuberculosis. Because of the frequency of tuberculosis as a cause of chronic uveitis and in spite of the lack of specific structure, the writer concludes that nodular infiltrations of the iris are of tuberculous nature.
Eugene M. Blake.

Finnoff, W. C. **A syndrome in uveal tuberculosis.** Arch. of Ophth., 1933, v. 9, Jan., pp. 13-24.

This form of ocular tuberculosis presents the following symptoms: (1) keratic precipitates of the mutton-fat variety; (2) evanescent grayish nodules at the pupillary margin of the iris (so-called Gilbert-Koeppe nodules); (3) increased intraocular tension; (4) vitreous exudates; and (5) one or more yellowish tubercles in the choroid. Illustrating these five points, eight cases are reported in considerable detail. The disease is chronic, running over a period of months or years. The outlook is grave, though occasionally good results are obtained. Therapy is not discussed in this paper. M. H. Post.

Fisher, J. H. **A case of severe sympathetic inflammation brought to a successful conclusion.** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 35.

One eye was lost from injury, and the fellow eye developed a sympathetic inflammation for which local and internal medication were administered without success. Seven years after this experience there was light perception; temporal projection fair, nasal uncertain. The anterior chamber was shallow, the pupil occluded, and tension subnormal. Under general anesthesia and following a cataract section a peripheral slit was made through the friable iris and adventitious capsule surrounding the lens. One blade of a capsule forceps was passed through this slit, the other into the anterior chamber anterior to the lens. Grasping the lens securely and with a sharp jerk it was successfully removed. The eye did not resent the violent treatment, the coloboma closed, and the iris became completely drawn up. About six months later an iridectomy was performed with de Wecker's scissors. One year later with +18 D. vision = 6/36. D. F. Harbridge.

Guillery, H. **The use of phosphatids in the study of sympathetic ophthalmia and other tuberculous diseases.** Arch. f. Augenh., 1932, v. 106, Dec., p. 359.

Guillery was able to produce the picture of sympathetic ophthalmia in rabbits' eyes by injection of Anderson's phosphatids (toxic substance derived from tubercle bacilli). The microscopic picture showed infiltration of the choroid by lymphocytes and giant cells, a picture similar to that produced in human eyes. The pathogenesis of sympathetic ophthalmia as based on experimental evidence is also discussed in detail. Frederick C. Cordes.

Löwenstein, Arnold. **Vitiligo iridis after varicella.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 790. (Ill.)

The brown right iris of a girl of six years showed light grey discoloration of a nasal section from the pupillary margin to the periphery, due to uniform complete depigmentation. The mother had noticed the spot after the child had had varicella at the age of two years.

C. Zimmermann.

Lyding, H. **Detachment and exfoliation of the anterior layer of iris stroma.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 793. (Ill.)

This condition was found in the lower half of the right iris of a woman of eighty-five years. The posterior layer of the stroma and the pigment-muscle layer were intact. Three similar cases published have occurred at advanced age, and were associated with cataract but showed no other affections, especially no hypertension, so that it is considered as a senile change. In a second group of cases the same clinical picture but of entirely different nature was observed in consequence of atrophic changes of the iris after iritis and in glaucoma, or after traumatism in glaucomatous atrophy of the iris.

C. Zimmermann.

Olah, Emil. **Iritis rosacea.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 61. (Ill.)

A woman aged twenty-three years, affected with typical rosacea of the face, showed vascularization of the left corneal margin, and iritis much resembling the tuberculous type. The originally blue iris was greyish-green and swollen, and there was a network of tortuous enlarged blood vessels on the ciliary portion. History, clinical examination, and Wassermann and tuberculin tests excluded syphilis and tuberculosis. The history suggested the possibility of an endocrine disturbance, and hormone therapy soon effected a cure.

C. Zimmermann.

Schieck, F. **Results of injection of the patient's own blood into the anterior chamber in tuberculosis of the anterior segment.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 1.

From the fact that patients suffering from tuberculous iridocyclitis are generally of normal nutrition and almost never show severe pulmonary changes Schieck argues that they are in a favorable state of resistance against tuber-

culous infection and that there must be special conditions which endanger the anterior portion of the uveal tract. He removes the aqueous and replaces it with the patient's blood. (See also editorial, American Journal of Ophthalmology, 1933, volume 16, page 350.) He treated by this method fifteen cases of tuberculous iridocyclitis, which are described in detail. All were improved and thirteen were cured.

C. Zimmermann.

Villard, H. and Dejean, C. **Cysts of the iris.** Arch. d'Opht., 1933, v. 50, Feb., p. 91.

This monograph undertakes to present all that is known concerning cysts of the iris up to the present time, including a classification and complete review of the literature.

In the classification four primary groups are considered: traumatic, parasitic, spontaneous, and congenital. In that portion of the monograph which is published in this issue the following types of cyst are discussed: traumatic, subdivided into pearl, epithelial, and endothelial; parasitic; spontaneously acquired, subdivided into cysts formed by retention, by adhesion, by division of the posterior epithelium, and free cysts. In so far as possible the pathogenesis, pathologic anatomy, and symptomatology of each type of cyst is considered. Numerous drawings and photographs are given. (To be continued.)

M. F. Weymann.

Wachendorff, A. **Three cases of sympathetic ophthalmia cured with atophanyl.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 81.

Three cases of certain sympathetic ophthalmia, two of which were confirmed anatomically, were cured by intravenous injections of atophanyl. One injection daily or every second day is recommended until improvement is noticeable. C. Zimmermann.

8. GLAUCOMA AND OCULAR TENSION

Amman, E. **Diocain in tonometry.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 807.

With tuberculous iritis the right eye had intraocular tension of 50 mm. After persistent use of pilocarpin the tension stayed almost normal. An acute attack of glaucoma was promptly checked by pilocarpin-eserin solution. Two tonometric tests under local anesthesia with diocain 1/5 percent were immediately followed by acute attacks, attributed to the diocain. The author advises instillation of pilocarpin after the use of diocain. C. Zimmermann.

Bunge, E. **Permanent results of cyclodialysis.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 21.

This is a detailed report on the material of the eye clinic of the University of Kiel where the great majority of the operations were performed by Heine, the originator of cyclodialysis. The indication accepted was that in spite of medicinal therapy vision and visual field deteriorated; the amount of hypertension being less determinant. In all forms of chronic glaucoma cyclodialysis is considered equivalent in effect, and superior as to later complications, to the trephine operation. Cyclodialysis ought to be performed first, and then, in case of failure, trephining.

C. Zimmermann.

Meszaros, K. and Toth, Z. **The peripheral vascular system of glaucoma patients.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 67. (Ill.)

On patients with primary glaucoma the authors studied the reactive hyperemia, the blood pressure, and the vascular pressure of the skin, with capillary-microscopic examination of several places on the skin and the ocular conjunctiva. They found marked changes in structure and function of the vessels corresponding to vasomotor neurosis, for example, great retardation of reactive hyperemia. C. Zimmermann.

Sondermann, R. **Intraocular pressure and circulation in the human eye.** Arch. f. Augenh., 1932, v. 106, Dec., p. 320.

The article is a continuation of the author's work on the origin, physiology, and pathology of intraocular pressure.

The embryology and function of Schlemm's canal are discussed. Sondermann concludes that the drainage of aqueous takes place primarily or perhaps entirely through Schlemm's canal, while the resorption of corpuscular elements takes place through the iris and ciliary body. The production of aqueous in the embryo and the adult is also discussed. Frederick C. Cordes.

Van Heuven, J. A. **Glaucosan-cataphoresis.** Arch. f. Augenh., 1932, v. 106, Dec., p. 625.

Van Heuven reports a case in which one eye was lost after trephining, while in the second eye pilocarpin no longer controlled the tension. Cataphoresis with small quantities of glaucosan used over a long period again restored the action of pilocarpin to the point where it controlled the tension. It finally became necessary to use the glaucosan only at long intervals.

Frederick C. Cordes.

Velhagen, K., Jr. **Light registration of intraocular tension.** Arch. f. Augenh., 1932, v. 106, Dec., p. 493.

Velhagen describes a method of registering intraocular pressure by the use of Wessely's manometer. The author's method differs from others in that the mirror is not attached to the manometer membrane but to the lever.

Frederick C. Cordes.

9. CRYSTALLINE LENS

Feigenbaum, A. **The origin of lenticonus anterior.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 103.

Feigenbaum observed the lens changes over a period of six years. He concludes that lenticonus anterior is a malformation acquired in the course of postembryonic life on the basis of congenital weakness of the anterior capsule of the lens, depending probably on disturbances in an early embryonic period during separation of the lens vesicle from the surface ectoderm. The anomalous convexity may increase in the course of life and may sometimes lead to bursting of the capsule, flattening, and formation of a stationary anterior capsular cataract with remarkable improvement in vision, so that one should not advise extraction of the lens too quickly. There is a close analogy to lenticonus posterior and posterior polar cataract, often associated with the anterior condition.

Phillips Thygeson.

Keys, M. J. **The extraction of soft cataract by suction; presentation of two unusual cases.** Trans. Pacific Coast Oto-Ophth. Soc., 1932. 20th annual meeting, p. 110.

The author briefly reviews the history of removal of cataract by suction, and describes the operation as performed by Teale in 1864. After dilating the pupil, the lens is needled, but the posterior capsule is not injured. About a month later, through a corneal incision, a hollow canula is introduced and the soft lens material sucked out. The operation should be confined to soft, liquid and traumatic cataracts. In old people with a hard nucleus, it is unsuitable. In young subjects it should not be attempted until a discission has entirely softened the lens material. Two cases are cited in which bilateral cataracts were removed in this manner, with excellent result.

M. E. Marcove.

Manes, A. J. **Observations on complete extraction of cataract by the procedure of Stanculeanu-Török-Elschnig.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 65.

Over four hundred cases have been operated upon so far by this method at the Rawson Hospital in Buenos Aires. The final result depends greatly on the condition of the vitreous. Extracapsular extraction is preferred to intracapsular with loss of vitreous. Retrobulbar injections, by producing hypotension through dehydration of the vitreous, make the operation easier. Detachment of the retina after extraction has been more frequent than when extraction with capsulotomy was practised. The author states that iris prolapse, when observed early and treated with retrobulbar injections, miotics, and the ther-

mophore, may be reduced in fifteen minutes. The first dressing is done in twenty-four hours and prolapsed irises are thus treated early and promptly.

M. Davidson.

Michail, D. **Postoperative epithelialization of the anterior chamber of an eye, under biomicroscopy.** Ann. di Ottal., 1932, v. 60, Aug., p. 553.

An eye of a woman of forty-eight years had been operated upon six months before for senile cataract. Sight had not been improved and only light perception remained. There were irritative symptoms with an irregular operative cicatrix, two small implantation cysts, anterior synechia and secondary cataract. Under the biomicroscope a fine transparent membrane was seen beginning at the pupillary margin, blending with the laminae of the secondary cataract, passing to the posterior surface of the cornea, and extending beyond the iris synechia. Iridectomy was followed by iridocyclitis and glaucoma. All the symptoms disappeared under local and antisyphilitic treatment, and the membrane, which histologically was found to be of epithelial tissue, completely disappeared. (Illustrations, bibliography.)

Park Lewis.

Sobhy Bey, Mohammed, and Attie, E. I. **Total extraction of cataract by the erisiphake** (Barraquer). Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 72.

The authors describe the advantages of intracapsular over extracapsular extraction of cataract and advocate general use of the former. They employ Barraquer's erisiphake.

Phillips Thygeson.

Spratt, C. N. **Motion picture—cataract operation.** Trans. Pacific Coast Oto-Ophth. Soc., 1932. 20th annual meeting, p. 115.

The author showed moving pictures of his method of cataract operation in which a conjunctival pocket is dissected and a suture placed before the section is made. Akinesia is not used. The chief advantages of this operation are: (1) a practically sterile field for incision; (2) protection against loss of vitreous; (3) downgrowth of epithelium in the wound impossible. (Discussion.)

M. E. Marcove.

10. RETINA AND VITREOUS

Addario, C. **The surgical treatment of detachment of the retina.** Ann. di Ottal., 1932, v. 60, Aug., p. 608.

Reattachment of detached retina by ignipuncture was described by the author some forty-three years ago. After evacuating the fluid under the retina he made from ten to twelve ignipunctures at a distance of a centimeter from the sclerocorneal border. But after many years experience it was found that the cases of retinal detachment that were permanently cured were very exceptional and were traumatic cases without other pathology and without progressive myopia. Park Lewis.

Arruga, H. **Experimental choroidal adhesions.** Ann. di Ottal., 1932, v. 60, July, p. 473.

In a majority of cases of detachment of the retina obliteration of the space can be secured by cauterization, but marked differences are found in the nature of the choroidal reattachment, depending on the method employed. Experiments were made by the author on rabbits and on one human eye soon to be enucleated for choroidal sarcoma. It was found that rapid thermopuncture had the effect of a simple incision, light inflammatory reaction of the membrane following. If the cautery point was more slowly applied it made little difference whether it was white or red, the extent of heat irradiation depending on the duration of the application. The adhesions of the retina and choroid did not become firm until the sixth day.

Injection of cyanide of mercury, after incision, caused cicatricial adhesion without destruction of the retina. Chemical cauterization produced a more or less accentuated reaction. Application of potassium in substance must be very brief: it is more satisfactory to apply three to five percent solu-

tion more slowly. Tincture of iodine gives a strong local reaction. Nitrate of silver, chloride of zinc, or sulphate of copper gives a lesser result but all cause adhesion of the tissue. Dosage is of first importance.

Superficial application of diathermy to the sclera will cause intense subretinal fibrinous exudate. The retina is peculiarly susceptible to this current and may easily be destroyed. Trephining of the sclera with closure of the tear is quite different in effect from thermopuncture. In the former a chorioretinal adhesion forms, requiring a more prolonged period of rest, while in the latter a vitreous hernia favors rapid healing. Diathermy may be judiciously used when the detachment is light and it is desired to preserve as far as possible the usefulness of the retina. Electropuncture gives the mixed results of thermopuncture and diathermy combined. The paper illustrates the effect of each method. Park Lewis.

Ascher, K. **Histology of pigmentary degeneration of the retina.** Arch. f. Augenh., 1932, v. 106, Dec., p. 585.

Ascher reports the histological findings in a case of retinitis pigmentosa. In the macula there was marked hypertrophy of connective tissue in the choroid with greatly thickened vessel walls. The hyaline membrane was retained. The pigment epithelium was almost completely destroyed, as was the sensory epithelium. The rods and cones were destroyed, and the retina as a whole showed marked degenerative changes with pigment clumping. The author discusses at length the present conceptions of the etiology of retinitis pigmentosa. Frederick C. Cordes.

Bruoth. **Pseudo-albuminuric retinitis.** Oft. Sbornik, 1932, v. 7, pp. 85-86.

A boy aged eleven years had unilateral retinitis with slight edema of the disc and star-shaped exudates in the macula. In the absence of other etiology and with x-ray showing areas of calcification in the hilus, the author thinks this a tuberculous process. During the course of the illness (fourteen months) the vision was 6/8, and after recovery 6/6. G. D. Theobald.

Coppez, Leon. **Dosage of transscleral diathermo-coagulation with pyrometric electrode.** Arch. d'Opht., 1933, v. 50, Feb., p. 122.

Measurement of intensity of heat applied to the sclera in surgical diathermy for detachment of the retina is difficult because the weak current used does not register well on the milliamperemeter, and the same degree of current will provoke different temperature reactions according to the body resistance, separation of the electrodes, and other factors. The writer has incorporated a thermocouple in the active electrode so that with a second couple in the circuit at a constant temperature a millivoltmeter may be used calibrated directly in degrees centigrade. The rheostat is then manipulated so that the desired temperature is reached after about fifteen or twenty seconds and maintained over a period of five seconds.

In a series of experiments upon the eyes of rabbits it was found that a temperature of 80° centigrade maintained for five seconds produced the desired amount of coagulation to produce retinochoroidal adhesions without destructive effect. A temperature of 70° was insufficient, while 90° gave too much reaction and would be clinically destructive. In a series of animals when the reading was 80° approximately the same effect was always observed.

M. F. Weymann.

Davids, H. **Retinal detachment following formation of a retinal hole.** Arch. f. Augenh., 1932, v. 106, Dec., p. 567.

Davids was able to observe the formation of a hole in the retina secondary to a focus of chorioretinitis. From this a detachment of the retina developed. This the author feels was not the result of the vitreous flowing between choroid and retina or of pull from within. Davids feels that with the development of the hole a small amount of vitreous was drawn between choroid and retina; that this irritated the retina

from behind, causing exudation and the formation of a vesicle with the hole in the retina at the top; and that repetition of the process increased the detachment and could finally produce complete involvement.

Frederick C. Cordes.

Fischer, V., Bunau, H., and Fischer, F. P. **Has the vitreous a metabolism?** Arch. f. Augenh., 1932, v. 106, Dec., p. 463.

From their work, the authors believe that the vitreous has no metabolism either in vivo or in vitro; that is, there is no consumption of oxygen or production of carbonic acid. The vitreous then, does not "breathe," has no measurable metabolism, and consequently is not a tissue in the strict sense of the word. Frederick C. Cordes.

Guerra, Paolo. **Behavior of retinal arterial tension in cranial traumatism.** Minerva Med., 1933, 24th year, v. 1, Feb., pp. 215-225.

In twelve patients with more or less severe injury to the head and prolonged loss of consciousness, there was also persistent redness of the optic disc, with an edematous halo extending on to the surrounding retina; and in all these cases the author noticed an increase of retinal arterial tension contemporary with the peripapillary edema.

W. H. Crisp.

Junius, P. **Retinitis exudativa of Coats and retinochoroiditis parapapillaris.** Arch. f. Augenh., 1932, v. 106, Dec., p. 474.

Junius reports three cases of exudative retinitis of Coats which he feels were of tuberculous origin, one of them observed for seventeen years. In addition, he reports three cases of retinochoroiditis parapapillaris in which tuberculosis also had to be considered as a possible etiological factor. He feels there is a definite relationship between these two rare fundus lesions.

Frederick C. Cordes.

Lopez Enriquez, M. **An instructive case of detachment of the retina.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Feb., p. 112.

The author reports in detail and illustrates with panoramic views of the fundus a detachment of the retina in a woman of twenty-eight years, with three diopters of myopia. The condition resulted from striking the head against a window and the patient had forgotten the injury until a careful anamnesis was taken. The necessity of having a record of the status of the eye of the worker from the compensation standpoint is stressed. M. Davidson.

Lopez Enriquez, M. **Mechanical stimulation of the retina. A valuable means of ophthalmic exploration.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Jan., p. 33.

The author observed a case of double retinal detachment with a cataract and with excellent light projection but absence of phosphenes on mechanical stimulation with finger or rod in one eye; and a case of detachment in which the reliability of the test was demonstrated by the different behavior of the attached and detached portions of the retina. He suggests that the production of phosphenes by mechanical stimulation is a valuable method of examination in detachment of the retina, particularly when thorough examination of the fundus is impossible, and that light projection to determine operability of cataract should be supplemented by examination for phosphenes.

M. Davidson.

Mann, Ida. **Notes on the lateral eyes of Sphenodon with special reference to the macular region.** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 1.

This animal belongs to the third order of the Reptilia, the Rhynchocephalia. It thus occupies a position between the tortoise and the crocodile. The eyes are provided with thick movable lids, the cornea extremely transparent. The fundus reflex is a silvery green. There are no vessels in the retina and the choroid is nowhere visible. The central retinal artery is present in a rudimentary form but does not extend beyond the border of the disc. A histo-

logical confirmation of the interesting intra-vitam appearances is discussed. (Seven illustrations; bibliography.)

D. F. Harbridge.

Papagno, M. **Recurrent retinal hemorrhage and normal menstruation.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 898.

Papagno's patient was a woman of thirty-five years whose health was excellent, and who had had no menstrual trouble. There had been one extrauterine and three normal pregnancies. A few days before a menstrual period, vision in the right eye was suddenly reduced to 0.1 by retinal hemorrhages, one in the papillomacular region. Physical examination and laboratory studies were negative. After four months the hemorrhages recurred two days before menstruation, and vision was permanently reduced to light perception. The bleeding was attributed to weakening of the walls of the retinal veins, brought about by a toxic substance resulting from disturbed ovarian hormones.

Eugene M. Blake.

Paul, L. **Contributions to localization ophthalmoscopy.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 730. (Ill.)

For ascertaining the apparent position of a point of the fundus it is necessary to measure the angles under which the ophthalmoscopic rays impinge on it. A little apparatus devised by the author is described with directions and calculations for localization.

C. Zimmermann.

Pavia, J. L. **Cinematography of the living ocular fundus.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 76. (Ill.)

In this preliminary communication Pavia describes his cinematographic attempts with the latest reflex free model of a combination of Nordenson's retinograph with the camera constructed by Zeiss. The reproduced films show the fundus of patients suspected of increased intracranial pressure, but with negative vascular tonometry. The exposure was made while pressure was applied to the eyeball in order to show the pulsation of the central retinal artery.

C. Zimmermann.

Stern, Heinrich. **Entoptoscopy and its clinical use.** Zeit. f. Augenh., 1933, v. 79, Jan., p. 361.

With this entoptoscope it is easy to manifest the phenomenon observed as early as 1813 and mentioned by Purkinje and Helmholtz among others, and probably caused by movement of the blood corpuscles in the precapillary arterioles. Scheerer called it the retinal vessel phenomenon and noted it as positive if no pulsation was seen, negative if pulsation was found, and zero if no motion at all was seen. He found it negative in normal individuals and in those who had ocular disease which did not involve the retinal vessels; and positive when the retinal vessels were involved and in general vasoneurotics; and Stern corroborates Scheerer's statements, though he thinks one goes too far in drawing general conclusions from a positive retinal-vessel phenomenon, and he agrees with Horniker that many patients have difficulty in noting the pulsation. In several cases of retrobulbar neuritis of unknown etiology he noted that the retinal vessel phenomenon was zero as long as the scotoma persisted and then became negative. However, the moving bodies were smaller and fewer and their movements slower than in the sound eye. The clinical findings in three patients with symptoms of Horniker's "retinitis centralis angioneurotica" are given, but the sign which justifies the author in identifying the retinitis with a mild choroiditis is not noted.

F. Herbert Haessler.

Terrien, F., Veil, Prosper, and Dollfus, M. A. **Fourteen cases of detachment of the retina treated by suprachoroidal galvanocauterization.** Arch. d'Opht., 1933, v. 50, Feb., p. 81.

The technique used was that of Paufique, in which the carefully localized tear is surrounded by several short linear incisions through the sclera to the choroid. A spatula introduced through these incisions separates the

choroid from the sclera, forming a suprachoroidal pouch. The cautery point is introduced cold into this pouch, and then the current is passed for two to three seconds. Diagrams illustrating the technique make it more understandable. Postoperative hemorrhages are frequent, but rarely serious. Eight case histories are given. Twelve of the patients had very large tears, and of these six were cured and three improved. Of two cases without visible tear one was cured and one improved. This operation is particularly recommended for those cases where large or multiple tears render cautery puncture impossible. M. F. Weymann.

Tillé, H. **Detachment of the retina probably by edema in an eclamptic. Relative retinal arterial hypertension in the detachment.** Ann. d'Ocul., 1933, v. 170, Jan., pp. 60-72.

In a seventeen-year-old pregnant girl there was almost complete retinal detachment in each eye without retinal tear or disease of the vitreous. There was general edema and hypertension with albuminuria and uremia. Pregnancy was terminated by cesarian section, the condition of the patient improved, and the detachments gradually disappeared. The author recognizes two types of this condition, one in which the retinal arterial tension is high and one in which this tension is normal or low. H. Rommel Hildreth.

Zorab, A. B. **A case of diabetic retinitis.** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 41.

A crimson retinal background showed the vessels in startling fashion, silver white, bright and distinct, even the smallest twigs. A branch retinal artery could be traced till it broke up into a fine network, and from here could be traced back as a vein to the main vein. In three separate parts of the fundus could be observed with absolute distinctness anastomosis between two small branches. There were no retinal hemorrhages. There was no lipemia. D. F. Harbridge.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Drake, R. L. **Ocular syphilis: 3: review of the literature and report of a case of acute syphilitic meningitis and meningo-encephalitis, with special reference to papilledema.** Arch. of Ophth., 1933, v. 9, Feb., pp. 234-243.

In any patient presenting signs of meningeal involvement, acute syphilitic meningitis and meningo-encephalitis should be considered, even though these conditions are rather rare. Papilledema should always be looked for, and will be found to respond well to antisyphilitic treatment. Of fifty cases reviewed by the author, it was present in sixteen, ranging from two to five diopters. In many cases no previous treatment for syphilis had been administered. Headache, cervical rigidity, and paralysis of the cranial nerves are the most constant symptoms. One new case is reported. M. H. Post.

Hamburg, J. **On favorably influencing tabetic optic atrophy by increasing cell oxidation.** Zeit. f. Augenh., 1933, v. 79, Jan., p. 331.

In tabetic optic atrophy it is purposeless to therapeutically storm the blood-brain barrier since the spirochetes are all on the near side of the barrier. Also, the direct action of the spirochetes is not the only factor in the pathogenesis of the ailment. A toxin which may reach the nervous tissues from the cerebrospinal fluid is postulated by many authors, though its actual nature has not been discovered. Of the toxic amblyopias, poisoning with methyl alcohol is most like tabetic optic atrophy. Methyl alcohol decreases cell oxidation, and it does this by retarding catalysis of heavy metals. If tabetic optic atrophy also resulted from retardation of heavy metal catalysis, then therapeutic measures which stimulate oxidation might increase nerve function. Thyroxin has a favorable influence on alcohol intoxication. Manganese stimulates oxidation. In seven patients a one percent solution of potassium permanganate was injected intramuscularly every other day and thyroxin was injected

intravenously in doses of one milligram once or twice daily. In each case the patients reacted with headache, pains referred to the bones of the legs, increased pulse rate, sweating, and tremor of the extremities. In five of the patients there was improvement and in four of them the improvement was striking. F. Herbert Haessler.

Koch, C. **Worms' decompressive trephining of the optic canal.** Ann. di Ottal., 1932, v. 60, Aug., p. 593.

Certain cases of optic neuritis and of postneuritic optic atrophy do not respond to the usual treatment. In 1930 Worms described an operation to relieve pressure on the optic nerve by cutting away the bony tissue of the foramen; and reported four successful cases, three for probable and one for definite purulent ethmoiditis. The author undertakes to show from work on the cadaver that the operation would not relieve pressure by decompression because it would not enlarge the optic canal at its proximal end. (Bibliography.) Park Lewis.

12. VISUAL TRACTS AND CENTERS

Cavina, C. **The present status of surgery of the hypophysis.** Riv. Oto-Neuro-Oft., 1932, v. 9, May-June, pp. 205-370.

The author discusses the differential diagnosis between hypophyseal and extrahypophyseal lesions and reports three personal cases operated on by his own method. He discusses the different intracranial, transsphenoidal, and palliative methods, different modes of anesthesia, the technique of skull trephining in endocranial methods and of trephining of the sella, the danger and accidents of the operations, postoperative complications and their treatment, and radiotherapy. Surgery is indicated in tumors and cysts. Ailments of probably toxic hypophyseal origin belong to the surgical field. Early diagnosis and early operation are the basic elements for successful hypophyseal surgery. Radiography may be used for radiosensitive tumors with the exception of rapidly growing tumors which threaten the visual power. X-rays and radiotherapy are useful complements to surgery. The unilateral frontal route is now preferred among intracranial methods, and the transsphenoidal among extracranial. (Bibliography and 63 figures.) Melchiore Lombardo.

Hammer, C. **Unilateral Horner syndrome after enucleation of both tonsils.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 79.

A girl aged twenty-one years, who had repeatedly suffered from tonsillar angina, showed the day after tonsillectomy under infiltration anesthesia a typical Horner syndrome of the left eye (protrusion of left eye 3 mm. less than of right, width of palpebral fissure left 1 mm. less than right, left pupil 1.5 mm. less than right) due to a lesion of the ciliospinal center from the infiltration anesthesia. There was no change after seven months. C. Zimmermann.

Hirsch, Oskar. **Nasal operation of hypophyseal tumors.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 782.

On 233 patients Hirsch performed under local anesthesia 237 operations according to his septal method, which after submucous resection of the septum leads to the anterior wall of the sphenoid, after its removal to the enlarged sella, and through this to the hypophyseal tumor. The mortality in the last thirteen years was five percent. The chief indications were progressive visual disturbances, and only in a small minority advancing acromegaly with unbearable headache. Improvement or complete restoration of vision was obtained in the majority of the cases.

The method permits of radical removal of an intrasellar tumor in the sphenoidal sinus, and of rational treatment of cystic tumors. The intracranial, solid tumors, however, which grow not only toward the sphenoidal sinus but also toward the cranial base, can only be partially removed. Not until the operation of these solid hypophyseal tumors was combined with radium treatment were permanent results attained. The author has made it a rule to count as permanent

only cases in which the improvement lasted more than four years.

C. Zimmermann.

Shimkin, N. **Contribution to the study of bitemporal hemianopsia of pregnancy.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 90.

On the basis of one observation of his own and six other cases described by different observers the author reaches the following conclusions: (1) In all the cases the hemianopsia developed in direct relation with the pregnancy. In six cases it was bitemporal and in one case binasal. (2) After delivery or after artificial interruption of pregnancy the visual field was enlarged, but at each new pregnancy the hemianopsia reappeared and became more and more stationary. (3) In all seven cases visual acuity diminished with the onset of pregnancy. In six cases primary optic atrophy developed in one or both eyes. (4) In the primiparas the hypophyseal tumor existed before pregnancy, while in the multiparas the tumor developed in connection with the repeated pregnancies.

Phillips Thygeson.

13. EYEBALL AND ORBIT

Herzau, Werner. **Supramaxillary osteomyelitis in three infants.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 55.

This disease is characterized by intense swelling of the lids, chemosis, and exophthalmos, with limited motility and fistulas on the infraorbital margin, the angles of the lids, the hard palate, the alveolar processes, and rarely toward the nose. It may lead to metastases in other bones and organs, brain and lungs, so that the mortality of twenty-nine percent is not surprising. Three cases, one with atrophy of the optic nerve, are described, all cured by early radical operation, except as to the optic atrophy. C. Zimmermann.

Herzau, W., and Pinkus, H. **Contribution to Schüller-Christian's disease.** Klin. M. f. Augenh., 1932, v. 89, Dec., p. 721. (Ill.)

Schüller in 1915 and Christian in 1919, independently, described a disease which if complete is characterized by defects of the skull, exophthalmos, and diabetes insipidus, and which Henschen considers as a special form of general xanthomatosis. This triad was observed in a boy aged six years. Roentgen rays showed an irregular defect in the right orbital roof and one at the occiput under a small tumor. The latter was excised, and presented the typical structure of xanthoma with characteristic accessory changes (eosinophilia, hemorrhages, incipient discoloration) due to disturbances of lipoid metabolism. An associated condition not hitherto described was an elephantiasis of the penis, perhaps produced by lymph stasis through a local xanthomatous process. C. Zimmermann.

Mazzei, A. **A rare case of tuberculoma of the orbit.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 916.

Mazzei's patient, a woman of twenty-nine years, presented a tumefaction of the right orbito-palpebral sulcus, with ptosis. Her history was negative, and her health had been excellent. The tumor had been present and growing for from three to four months, was noncompressible, immobile and painless, and the size of a large olive. Histologically it was a typical granuloma, apparently of endogenous origin. (Illustrations.) Eugene M. Blake.

Merrill, H. G., and Oaks, L. W. **Two cases of extreme bilateral exophthalmos: autopsy findings in one.** Trans. Pacific Coast Oto-Ophth. Soc., 1932, 20th annual meeting, p. 147.

In each case both eyes went on to complete destruction, in spite of everything that was done, including suturing of the lids. In one case bilateral enucleation was performed. In the other case vision was only light perception in each eye. The autopsy findings in this last case revealed the orbital muscles, fat, nerves, and vessels more firmly bound together by fibrofatty connective tissue than is normal. Microscopic examination showed marked atrophy of the muscles and optic nerve, with replacement by fibrous and fatty areolar

connective tissue. The small vessels were sclerosed. The large vessels and motor nerves were less affected. A review of the treatment of exophthalmos is given, including Naffziger's decompression of the orbit and optic foramen. (Bibliography, discussion.)

M. E. Marcove.

Torres Estrada, A. **New stump for improvement of ocular prothesis.** Anal. de la Soc. Mexicana de Oft., etc., 1931, v. 9, July, Aug., and Sept., pp. 32-42.

The author used formerly to insert a fat implant into the scleral shell, suturing the conjunctiva across the gap left by incision of the cornea. The conjunctival suture was frequently lost a few days after operation. He now cuts a sickle-shaped pedicled scleral flap on either side of the gap left by incision of the cornea, approximates and sutures them to each other after inserting the fat implant, and then sutures the conjunctiva over the firm foundation thus provided at the center of the stump. The traction formerly exercised upon the conjunctival suture is now resisted by the scleral flaps, and the results have been more satisfactory.

W. H. Crisp.

14. EYELIDS AND LACRIMAL APPARATUS

Marquez, M. **The blepharoplastic methods of the Santander surgeon Argumosa.** Arch. de Oft. Hisp.-Amer., 1933, v. 33, Jan., p. 1.

The credit for the operation ascribed to Diffenbach who first described it in 1835, and later modified by Szymanowsky, properly belongs to Don Diego de Argumosa, a Santander surgeon, who was born in 1792 and died in 1865. Photostatic copies of a manuscript of the proceedings of the scientific session of the medical faculty of the University of Madrid, November, 1833, and of a page from Hysern's "Tratado de la blefaroplastia temporofacial," published in 1834, establish Argumosa's priority. Another blepharoplastic procedure, described in Argumosa's "Resumen de cirugia" published in 1858, but first performed by him in 1834, is, except in minor details, that which Imre recently introduced in his "Lidplastik," published in 1930. (Illustrated.)

M. Davidson.

Onken, T. **Treatment of anomalies of position of the lids.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 78.

For moderate senile ectropion two to five punctures 0.5 cm. deep are made with the electrocautery at white heat into the everted lid 2 mm. from the border. In spastic entropion, under local anesthesia, the skin from below the temporal angle to the middle of the lid is rapidly punctured three to four times as far as the tarsus with the electrocautery at slightly white heat. Further down other punctures in decreasing number are added. C. Zimmermann.

Patel, V. P. **New lacrimal sac retractor.** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 39.

The blades of the instrument are long and possess three blunt teeth. This affords better retraction and does not tear the skin. The shaft is curved to fit the contour of the face. The instrument is also useful in operation for removal of intraorbital growths.

D. F. Harbridge.

Roda, J. R. **Poulard's stricturotomy.** Arch. de. Oft. Hisp.-Amer., 1933, v. 33, Jan., p. 40.

Stilling's method, revived and modified by Poulard with the use of large-caliber semirigid sounds, has accomplished results in most cases A Weber or, better still, a Llobera knife is used for the stricturotomy, and a number 11 or 12 sound is left in situ for several days.

M. Davidson.

Torres Estrada, A. **Improved technique for external dacryocystorhinostomy.** Anales de la Soc. Mexicana de Oft. etc. 1932, v. 9, nos. 12, 13, and 14, pp. 131-157.

The author covers with the mucous membrane of the sac and of the nose the whole posterior wall of the osseous trephine hole, corresponding to the anterior ethmoid cells. He uses a curved

needle threaded with 00 catgut and introduced through the nasal fossa. He states that his operation requires only twenty-five minutes for its performance, as against two hours often consumed in the Dupuy-Dutemps operation. (The attempted "English" abstract which accompanies the original article is the strangest effort of its kind which the reviewer has ever seen. As examples, the nasal mucosa is spoken of as the "pituitary," the mucous flap as the "tatter," proliferation as "gemmation," and the flap of lacrimal sac as "lacrimal bladder tatter.")

W. H. Crisp.

15. TUMORS

Bardanzella, T. **A case of cavernous angioma of tarsus and conjunctiva.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 781.

The cavernous angioma of the tarsus and conjunctiva described by Bardanzella was situated on the inner surface of the left lower eyelid near the margin and in the middle third. It affected a syphilitic forty-nine-year-old man, who had been gassed during the war. The interesting features were the location, which was apparently unique, the age of the patient, and the fact that the angioma arose in the region of the anterior perforating vessels of the tarsus from an apparently abnormal congenital state, aggravated by irritation of various sorts, especially tear gas. (Illustrations.)

Eugene M. Blake.

Fry, W. E. **Metastatic sarcoma of the choroid.** Arch. of Ophth., 1933, v. 9, Feb., pp. 248-255.

Metastatic sarcoma of the choroid is so rare that many eminent authors believe that there are no well authenticated cases on record. Nine such case reports found in the literature have been analyzed by the author, and one additional case is the subject of this paper. A pigmented nevus of long standing was injured. Pathological examination showed irregular and infiltrating growth of the cells, as would be expected in a primary tumor. Those of the choroid, on the other hand, were well circumscribed, corresponding to the usual findings in secondary tumor. There were several nodules of tumor growth in the eye. At one point tumor cells were seen in the lumen of a vessel. The largest lesion within the eye was so located and of such size as to interfere with macular vision, so that it would have been obvious to the patient had the condition been present for any length of time previous to death.

M. H. Post.

Mulock-Houwer, A. W. **Clinical diagnosis of angioma of the choroid.** Klin. M. f. Augenh., 1933, v. 90, Jan., p. 58.

The diagnosis of angioma is probably wrong if the tumor is not juxtapapillary, but perhaps correct if it lies close to the optic disc. This symptom gains in value in combinations with others enumerated. In the cases published since his article of 1925 and those formerly reported, twenty-four in all, except two, the angioma occupied the whole posterior segment or was at least juxtapapillary. Other symptoms were: enlargement of the vessels surrounding the tumor, the color of the prominence with absence of inflammatory or reactive changes in the vicinity, simultaneous vascular nevi of the face, degeneration at the macula, and sector-shaped defects of the visual field.

C. Zimmermann.

Panico, E. **Second contribution to the study of the "basaliomata" (basal-cell epitheliomata) of Krompecher, affecting the lids.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 773.

Panico's second case of "basalioma" affected the external angle of the left lower eyelid in a sixty-seven-year-old man. The mass was ulcerated, and possessed hard borders and a necrotic base. It was composed of granulating, newformed tissue and exuded a serosanguineous secretion. These tumors appear as nodules, grow slowly, and only rarely metastasize. Histologically, isolated nodules are found, sometimes becoming confluent, and containing single or grouped cells in process of keratinization. Epithelial pearls are usually

present, and these show degenerative changes in the center. True cystic cavities were present in this case. The author believes that these tumors have a double origin, from the basal layer of the epidermis, and from the sebaceous glands. (Illustrations.)

Eugene M. Blake.

Sitzimkopfora, Helena. **Bilateral scleral rupture.** Oft. Sbornik, 1932, v. 7, pp. 104-105.

A woman aged fifty-six years had had chronic iridocyclitis in both eyes for many years, secondary to running ears. She fell on a bed-post and ruptured the right eye; and a month later fell on a chair and ruptured the left eye. There is now an iris coloboma at the site of rupture in the right eye, the lens is slightly cloudy, and vision is 6/24. A mass of organized exudate fills the anterior chamber of the left eye, which is blind. (Bibliography.)

G. D. Theobald.

Tirelli, G. **Melanoma of the lacrimal caruncle.** Rassegna Ital. d'Ottal., 1932. v. 1, Nov.-Dec., p. 948.

Tirelli's patient, aged 51 years, had observed a small blackish spot upon the left caruncle since she was a girl of seven years. In 1927, after a slight injury to the region of the internal canthus, the nevus began to grow, slowly but steadily, assuming the appearance of a blackish band. The mass was cauterized five times but continued to increase in size. Surgical removal and further cauterization did not prevent continued growth. It eventually invaded the orbit, and removal was followed by death from metastasis. Microscopically the tumor was a melanoma, giving positive reaction for melanin by Unna's method. Eugene M. Blake.

16. INJURIES

Damel, C. S. **Eyelashes in the anterior chamber.** Boletin de Informacion Oft., 1932, fifth year, Sept.-Oct., pp. 269-279.

A boy of twelve years poked a knife into his right eye. Brought to the clinic a month later, he showed a sclerocorneal scar in the four o'clock position, with adherent iris. The aqueous was cloudy, and in the superior internal quadrant of the anterior chamber, apparently attached to the iris, were two eyelashes. The eye was enucleated to avoid sympathetic ophthalmia, and was studied microscopically. The lashes were surrounded by a layer of fibrin, and were inserted into the iris as far as the muscular layer. W. H. Crisp.

Giuffrida, G. **The prevention of eye injuries in industry.** Ann. di Ottal., 1932, v. 60, July, p. 498.

The value of routine use of protecting goggles is urged and statistics adduced to demonstrate the lessened frequencies of serious injuries in factories in which suitable prophylactic measures are employed. (Bibliography.)

Park Lewis.

Gray, W. A. **Penetrating wounds of the posterior chamber of the eye.** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 15.

This is a study of fifty-three cases of wounds of the sclera and other coats of the eye, exposing the vitreous; eighteen in the region of the limbus, and thirty-five purely scleral. In the series there was no panophthalmitis. In fourteen cases vitreous prolapse occurred but no infection resulted and useful vision was obtained. The second part of this investigation concerns itself with laboratory findings on rabbits. Liability to infection on the part of the vitreous was estimated from two aspects, where the bacteria were deeply placed, and where the superficial part of the vitreous was exposed. It thus appears under experimental conditions in the rabbit, as under conditions of clinical injury in man, that prolapsed vitreous has a considerable power of resisting infection, although injection of even a very small quantity of a virulent pyogenic organism to a depth of 5 mm. or more into the vitreous was almost invariably followed by a rapidly destructive suppuration of the eyeball.

D. F. Harbridge.

Jungraw, Izabelle. **A fatal case of endophthalmitis and purulent meningitis**

after accidental perforation of the cornea with a knife. Zeit. f. Augenh., 1933, v. 79, Jan., p. 368.

It is assumed that an unusually virulent organism entered the eye at the time of perforation, and that the constitution of the patient with large thymus and lymphoid hyperplasia was unable to resist it.

F. Herbert Haessler.

Lumbroso, U. **Injuries to the retina.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 813.

In an article of seventy pages, with twenty illustrations, Lumbroso very ably covers the question of retinal injuries, especially as related to retinal detachment. Often there is proliferation of the glial elements which presents a picture much like retinitis proliferans. The choroid also takes part in this process. In the region of the injury there is a degeneration of the retinal elements with consecutive disappearance. Contemporaneously there develops atrophy of the choroidal elements and an increase of cicatricial tissue. In the atrophic region of the retina and choroid there is generally a firm adhesion. There is no restitution of the destroyed parts but an extension of the destructive effect slightly beyond the point of injury. Eugene M. Blake.

Sabadeanu, V. **Migrating intraocular foreign bodies.** Arch. d'Opht., 1933, v. 50, Feb., p. 134.

One case report is added. Cataract subsequent to multiple wounds in the ocular region by a grenade explosion was extracted fifteen years later from an eye which appeared perfectly quiet. About one month later the eye became inflamed and a metallic foreign body the size of a pinhead appeared in the anterior layers of the vitreous and attached to the wound by vitreous strands. This was removed and shortly thereafter several new foreign bodies appeared in the same region. These also had to be removed before the eye became quiet. The foreign bodies were apparently disturbed by the operative procedure and migrated to a new position during postoperative hydrostatic adjustment. M. F. Weymann.

Sédan, Jean. **Prolonged tolerance of some large iris hernias.** Ann. d'Ocul., 1933, v. 170, Jan., pp. 72-77.

Three cases are reported, the first dating from a needle injury about twenty years previously, the other two following cataract extraction. In the first case the pseudocyst ruptured twice yet the eye has remained quiet and with normal tension. This patient and one other had trachoma and the third had chronic conjunctivitis; none has ever showed signs of iritis.

H. Rommel Hildreth.

Tirelli, C. **Complete tolerance of an eye to a chip of iron in the ciliary region with siderosis of the crystalline.** Ann. di Ottal., 1932, v. 60, July, p. 509.

The injury was diagnosed as a simple conjunctival traumatism. In the following year the patient was found to have mydriasis with paralysis of the ciliary nerves of the formerly injured eye. A small scar in the cornea showed that a foreign body had entered the eyeball but radiograms gave negative results. The vision of the affected eye was 8/10. Under the slitlamp the surface of the lens with maximum pupillary dilatation appeared to be covered with an infinite number of reddish-brown points closely packed together and uniformly dense from the center to the periphery. Brownish granules were more widely scattered on the posterior surface of the lens. The motion of the vitreous indicated beginning fluidity. The metal was thus wholly absorbed nine months after the original trauma, with siderosis of the crystalline but no involvement of other ocular tissues. Park Lewis.

Trantas, A. **Foreign bodies of the ciliary and retrociliary region, proved by digital and diaphanoscopic pressure.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 61.

The author emphasizes the frequency and importance of ophthalmoscopic lesions lying in the extreme periphery of the retina and choroid as well as in the

ciliary body and angle of the anterior chamber. Exploration of these regions, inaccessible to ordinary ophthalmoscopy, can be done in a complete and satisfactory way only by aid of digital or diaphanoscopic pressure. Three observations are reported.

Phillips Thygeson.

Villani, G. **Vossius cataract.** Rassegna Ital. d'Ottal., 1932, v. 1, Nov.-Dec., p. 885.

The patient described by Villani was a boy of fourteen years whose right eye had been struck two days previously by a ball of paper shot from a sling. The cornea was slightly edematous, the anterior chamber contained a clot of coagulated blood, and the pupil was moderately dilated. Upon oblique illumination the lens showed a faint opacity in its anterior portion, slightly smaller in diameter than the pupil. The slitlamp revealed a circular opacity, incomplete below, and with an undulating border. The space inside the circle was occupied by a disc-like opacity, composed of fine blackish points located in the subepithelial layer. Upon the surface of the lens was a sprinkling of iris pigment. Vision was reduced to 0.1. Within two days the opacity had disappeared except for a few very fine brownish points on the lens capsule. Final vision was normal. (Bibliography.) Eugene M. Blake.

17. SYSTEMIC DISEASES AND PARASITES

Gertson, G. D., Lancaster, W. E. G., Larson, G. A., and Wheeler, G. C. **Wohlfahrtia myiasis in North Dakota: report of two cases.** Jour. Amer. Med. Assoc., 1933, v. 100, Feb. 18, p. 487.

One of the two cases reported by the authors was in an eight-month-old female infant, in which there was involvement of the upper lid resembling very much hordeolum externum. There was marked edema of the lid with some conjunctivitis. The pustules ran a rapid course, finally rupturing. The larvae, plainly seen in the pus, were very motile, white, and apparently 6 to 8 mm. in length. They proved to be Wohlfahrtia vigil. In twenty-four hours after evacuation of the pus the eye appeared normal.

Search of the literature failed to reveal another identified case of Wohlfahrtia vigil myiasis involving the adnexa of the eye. Infection of the human being with larvae of Wohlfahrtia vigil, although rare, has been reported in North Dakota, mainly in infants or young children. Protecting the child during its outdoor sleeping hours is advised, especially during the month of June. George H. Stine.

Hesse, Robert. **A peculiar finding in the vitreous.** Zeit. f. Augenh., 1932, v. 79, Dec., p. 247.

In the vitreous of a thirty-four-year-old patient was observed a globular vesicular mass which created the impression that it had originated in the macula and had migrated into the vitreous, though it had remained attached to the retina by a fold of tissue containing a blood vessel. The body was thought to be a cysticercus, although no head was seen. No change was observed in the course of a year. Although it is generally believed that a living cysticercus is not tolerated by the eye without reaction, this observation suggests that such may not be true for the dead parasite. F. Herbert Haessler.

Maggiore, L. **Internal glandular secretions and the visual apparatus.** Ann. di Ottal., 1932, v. 60, July, p. 516.

The Ophthalmological Society of Paris invited Leopoldo Levi, to present a review of the present aspects of endocrinology at the society's last annual meeting, and this work Maggiore reviews in an article which should be useful for reference. The studies include the ocular signs connected with the thyroid, the parathyroid, the thymus, the suprarenals, the pancreatic syndrome, the pineal syndrome and that of Van der Hoeve, the sexual glands, the changes occurring in pregnancy.

Park Lewis.

Mattos, W. B. **Suppurative subconjunctival cysticercus.** Rev. de Ophth. de Saõ Paulo, 1932, v. 2, Dec., p. 111.

The mass, in a man of twenty-six years who had eaten a good deal of uncooked meat, especially pork, resembled externally a large chalazion in the lower lid. On everting the lid a subconjunctival cyst was seen, adherent to the sclera. Upon incision of the extremely thick conjunctiva, a large amount of pus escaped, containing a dead scolex.

W. H. Crisp.

Patel, V. P. **Does trauma favor the occurrence of the echinococcus in the orbit?** Brit. Jour. Ophth., 1933, v. 17, Jan., p. 40.

Dudinow, in 1932, reported a case of echinococcus of the orbit due to trauma. The author of this contribution reports a similar case. A boy aged twelve years was kicked by a donkey six months previous to observation. There was a swelling the size of a small orange in the region of the right lower lid. The eyeball was pushed up and in. Upon removal of the mass it was found to be a unilocular hydatid cyst.

D. F. Harbridge.

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

The annual assembly of the International Association for the Prevention of Blindness. Arch. d'Opht., 1933, v. 50, Jan., p. 5.

Fifty-eight pages are devoted to a report of the proceedings of this association, on November 19, 1932, in Paris. The titles of papers published in this report, along with the names of their authors, are as follows: Schools for amblyopes, Pierre Villey; Classes for amblyopes in England, N. Bishop Harman; Classes for the preservation of vision in the United States, Winifred Hathaway; Schools for amblyopes in Germany, D. Martin Bartels; Classes for amblyopes in Switzerland, Auguste Dufour; The Strasbourg school for amblyopes, E. Redslob; Creation of a class for amblyopes in Paris, A. Monbrun.

M. F. Weymann.

Attimonelli, R. **The diffusion of trachoma in the school population of Bari in relation to the improved hygienic condition of the city.** Ann. di Ottal., 1932, v. 60, Aug., p. 601.

Bari consists of two sections, the old and the new. Both have the same topographical conditions as to altitude, humidity, and so on, but in the old town the poor are crowded in unhygienic tenements. In this section are 30,000 people—about one-fifth of the population of the city, mostly the families of sailors and fishermen. Of those about 2,000 families, numbering some 8,000 people, are receiving public assistance. The children are undernourished and insufficiently clothed. In the old city, of 1,018 children 181, or 17.77 percent, were found trachomatous. In the new city, of 3,375 children, 295, or only 8.74 percent, had trachoma.

Park Lewis.

Chaillous, J. **J. Babinski (1857-1932).** Ann. d'Ocul., 1932, v. 169, Dec., pp. 945-950.

A biography.

Elliot, R. H. **The special features of ophthalmic practice in tropical countries.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 26.

Tropical ophthalmology presents certain definite characteristics which are reviewed by the author.

Meyerhof, Max. **Fifty years of ophthalmic progress in Egypt.** Folia Ophthalmologica Orientalia, 1932, v. 1, Nov., p. 5.

In 1882 there were only five oculists and a single eye department in a general hospital in all Egypt. Progress was made by European investigators visiting Egypt. In 1883 Koch demonstrated the gonococcus and the minute bacterium now known as the Koch-Weeks bacillus, and in 1901 Morax showed that trachoma was a disease most commonly contracted in infancy and commonly complicated by superimposed infection.

Practical progress in ophthalmology in Egypt is traced from the Cassel donation for travelling ophthalmic hospitals and the education of native oculists, under MacCallan. After the retirement of MacCallan the work was con-

tinued under the direction of Shahin Pasha, chief of the Department of Hygiene, and in 1930 forty-six ophthalmic hospitals with 1,100 beds were in operation. The number of patients treated was 526,000 and the operations performed over 200,000. There has been a definite decrease in the incidence of blindness and a remarkable repression of quack practices which in the previous centuries had plagued Egypt. Over one hundred and fifty native oculists have been graduated. The Egyptian ophthalmic service is probably the most extensive government organization in the world for combating ocular disease. Phillips Thygeson.

Reis, W. **Devils wearing spectacles.** Æsculape, 1932, 23rd yr., Oct., pp. 256-264.

In this handsomely illustrated essay, Reis describes and reproduces a number of paintings and engravings by artists of the fifteenth, sixteenth, seventeenth, and eighteenth centuries, in which the devil and various of his imps are depicted as wearing spectacles. The subject most frequently portrayed or caricatured is the "Temptation of Saint Anthony." W. H. Crisp.

Roy, J.-N. **Foucher (1856-1932).** Ann d'Ocul., 1932, v. 169, Dec., pp. 950-952.

A biography.

Terson, A. **Three little-known portraits of historic masters.** Ann. d'Ocul., 1932, v. 169, Dec., pp. 980-992.

This article gives a brief historic sketch of the lives of Jean Méry (1645-1722), Georges de La Faye (?-1781), and Jacques Tenon (1724-1816). Photographic copies of portraits accompany the article. H. Rommel Hildreth.

19. ANATOMY AND EMBRYOLOGY

Landauer, Walter. **The mechanical development and genetic causes of coloboma and other embryonic ocular malformations.** Graefe's Arch., 1932, v. 129, p. 268.

The creeper fowl is particularly characterized by exceptionally short extremities. In homozygote embryos of this fowl there were also found maldevelopment of the skull, absence of eyelids, microphthalmos, fundus coloboma, absence of the scleral cartilage, and so on. In the early embryonic stages, the homozygote Creeper embryos differ from the normal only by a general slowing up of growth, due to the loss of a section of the chromosomes. It is thought that similar processes play a significant rôle in the production of coloboma in man.

H. D. Lamb.

Redway, L. D. **Antiquity of the forms of the transparent ocular media.** Arch. of Ophth., 1932, v. 8, Dec., pp. 837-846.

The transparent media of the eye may be divided into epiblastic, under which we may consider the conjunctiva, cornea, lens, and retina; and mesoblastic, represented by the aqueous and vitreous. Two hypotheses as to their development are possible. They represent either an involutionary synthesis of a high order of differentiation, or slightly modified forms of primeval or primitive structures. A number of simpler forms are considered from this point of view.

M. H. Post.

Rochon-Duvigneaud, A. **Outline of a comparative ophthalmology of vertebrates.** Ann. d'Ocul., 1933, v. 170, Jan., pp. 1-42.

This is a most interesting comparative study of vertebrate eyes, beginning with lower forms and running up through amphibians, birds, and mammals. Following a discussion on embryology and general morphology the author considers the comparative anatomy of the different forms. Eleven figures illustrate well this chapter. The histology, physiology, correlation of different parts of the eye, and modifications of the eye, fitting certain types to environment, are considered in separate chapters. The paper ends with a comparison of vision in the vertebrate series. Some birds have visual acuity three or four times that of man yet the greater motor and brain development in man, with his stereoscopic vision, gives him vision of the highest order.

H. Rommel Hildreth.

NEWS ITEMS

News items in this issue were received from Drs. Harry Friedenwald, Baltimore, and Harvey J. Howard, St. Louis. News items should reach **Dr. Melville Black, 424 Metropolitan Building, Denver,** by the twelfth of the month.

Deaths

Dr. Hilliard Wood, Nashville, Tennessee, aged sixty-seven years, died, February 23rd, of heart disease.

Dr. Rhodulphus H. Rice, Milwaukee, Wisconsin, aged sixty-three years, died, February 8th, following an operation for mastoiditis.

Dr. Herbert G. Parker, for over thirty years an ophthalmic surgeon at Bolton, England, died, February 10th, of heart trouble with complications.

Miscellaneous

The Pennsylvania Institution for the Instruction of the Blind was recently left $5,000 by the will of the late Florence Ludwig.

The Oxford Ophthalmological Congress will be held July 5 to 8, 1933. Inquiries should be addressed to Mr. C. G. Russ Wood, Secretary and Treasurer, Hill House, Abberbury road, Iffley, Oxford.

A graduate course in medicine will be conducted, June 19th-24th, by the general extension division of the University of Florida, under the auspices of the Florida State Medical Association. Two lectures on eye work are being planned. Dr. John M. Wheeler of New York has been invited to participate in the course.

A new review for the medical profession of the Mediterranean countries and the "Middle East", entitled "Folia Medica Orientalia", has recently been established in Jerusalem. The publication is to appear in sections, each devoted to a specialty. The Folia Ophthalmologica Orientalia, of which Dr. Aryeh Feigenbaum, Jerusalem, is editor, has already appeared.

The Institute of Ophthalmology of the Columbia University Medical Center, begun in 1931, was opened for patients in January. The new hospital, said to be the only one in New York devoted exclusively to treatment of diseases of the eye, is at Fort Washington Avenue and One Hundred and Sixty-fifth street. The building is nine stories high, with a capacity of eighty-six beds. The institute will have a staff of fifteen physicians, six interns, and thirty nurses, under the direction of Dr. John M. Wheeler.

The eleventh annual Colorado summer graduate course in ophthalmology and otolaryngology will be given in Denver from July 17th to 29th, inclusive. Applications for registration should be made to Dr. Harry L. Whitaker, 1612 Tremont pl., Denver, Colorado.

Personals

Dr. T. M. Li has changed his address from 25 Jinkee Road to No. 19 Yuen Ming Yuen Road, Shanghai, China.

The Faculty of Medicine of Lyons, France, at a ceremonial, November 3, 1932, conferred the degree of Doctor, Honoris Causa, on Prof. Emil von Grosz, professor of clinical ophthalmology and formerly dean in the Royal Hungarian University of Budapest Faculty of Medicine.

Dr. Henry Dickson Bruns, emeritus professor of diseases of the eye, Tulane University of Louisiana School of Medicine, New Orleans, was honored recently when a bronze plaque was placed on the door of the diagnostic room for the eye department of the Eye, Ear, Nose and Throat Hospital. This room has been dedicated to Dr. Bruns in recognition of nearly fifty years' service in the hospital.

Dr. Joseph Mülzer of Heidelberg University, Germany, was guest of honor at a recent reception given by Dr. and Mrs. Carl Barck, in honor of his appointment to the department of ophthalmology at St. Louis University School of Medicine, St. Louis. Dr. Mülzer is the recipient of the Carl Barck Ophthalmology Fellowship, the funds for which were provided by a group of Dr. Barck's friends on the golden anniversary of his graduation from the University of Freiburg, Baden, Germany, celebrated last year.

Dr. Harvey J. Howard of Saint Louis addressed the Sangamon County Medical Society, Springfield, Illinois, on the evening of April 6, 1933, on "The Contribution of Aviation to General and Special Medicine".

The Board of Directors of City Trusts, of the City of Philadelphia, has appointed Dr. Louis Lehrfeld Neuro-ophthalmologist to the Wills Hospital. Dr. Lehrfeld will be associated with Dr. T. H. Weisenburg, Consulting Neurologist of the Hospital in the Department of Neurology.